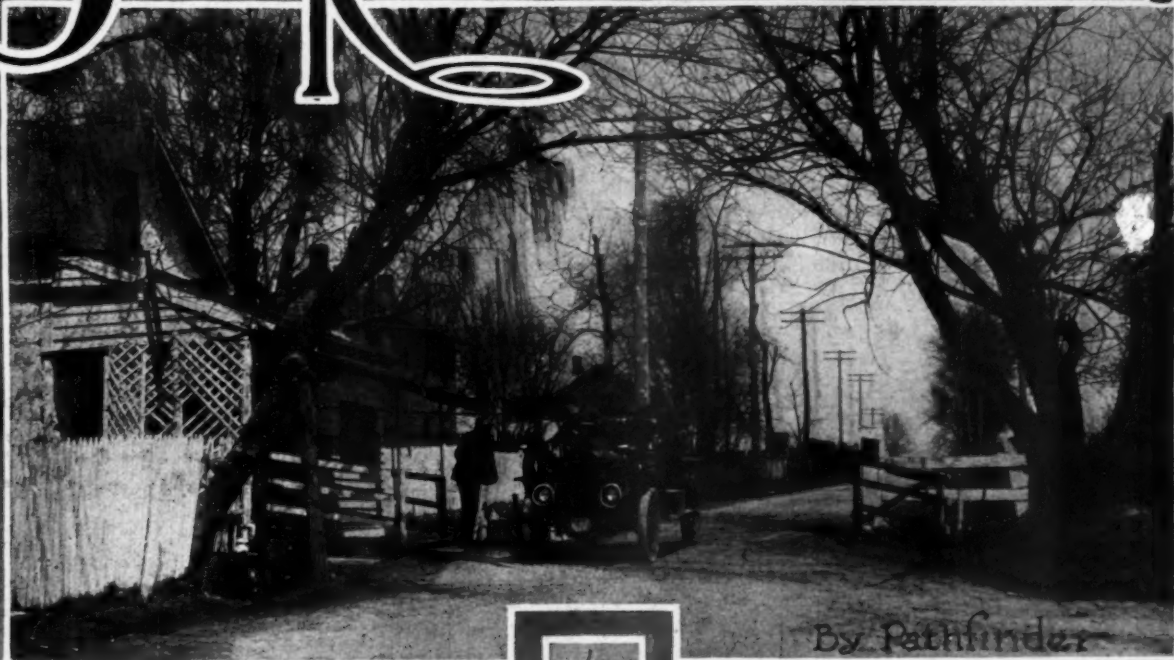


# THE AUTOMOBILE

## "On to Richmond!"—Nowadays



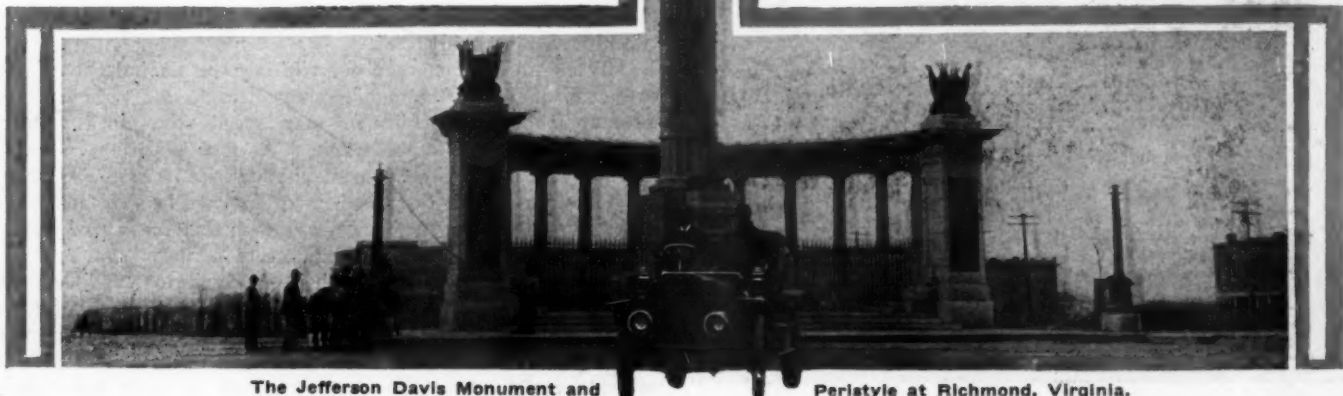
By Pathfinder

SUDDENLY realizing that an Easter vacation was to be had for the taking, the thought came to mind that Spring would be awakening down Virginia way. Hence the old cry of "On to Richmond!" found lodgment in my brain, and late the same day—which was Good Friday—I was leaving the metropolitan maelstrom in company with friends who accepted promptly the invitation to go along in my White steamer.

We drove to New Brunswick and there spent the night. The next morning we hustled over the road to Trenton, and here, crossing the river, drove into Phila-

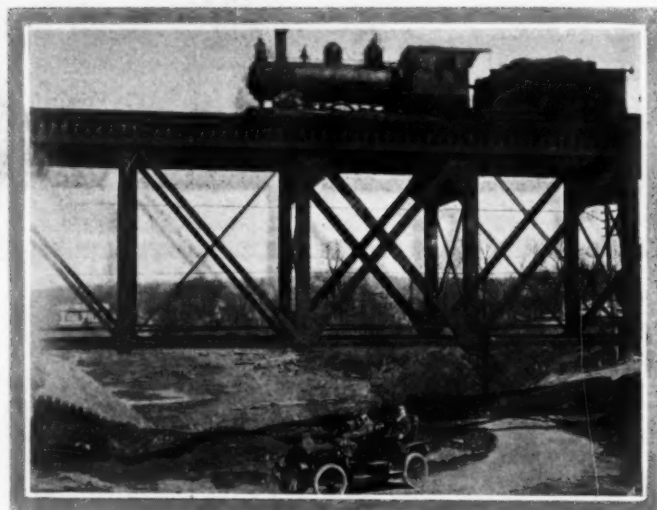
delphia by way of Bustleton. This route proved to be much more interesting than the usual route via Bordentown and Burlington, and, besides, we avoided the ferry at Camden and the narrow east-and-west streets of Philadelphia, with blocks of two-story houses.

Coming into the city by way of the Old York Road and North Broad street, we stopped only long enough to have luncheon and then continued straight out South Broad street. Chester was the next town on our route, and we found the roads south of that place quite as neglected as they were two years ago when we passed



The Jefferson Davis Monument and

Peristyle at Richmond, Virginia.



The Rail Bound Steamer and the Trackless Steamer.

through that town on our way to Cape Charles and Norfolk. I make special note of this fact because almost invariably, when covering a route for the second time, I find the roads in better condition than before, thanks largely to the vigorous good roads campaign which the users of automobiles are conducting in all parts of the country.

Soon we were on the fine toll-road leading into Wilmington, and, on reaching that city, we turned off to the southwest and headed for Newark, Del. After leaving Wilmington we were in a section that none of us had before traveled in a car and, consequently, we had to find our way by asking questions at each fork and crossroad. We found the road unexpectedly good, and it did not take us long to reach Newark, and from there to Elkton. Near the latter town the good roads stopped and the road became rather rough, with occasional stretches of sand. Continuing through Northeast and Principio, we reached the Susquehanna River at Perryville just at dusk. The ferryboat happened to be on that side of the river and we were soon across at Havre de Grace.



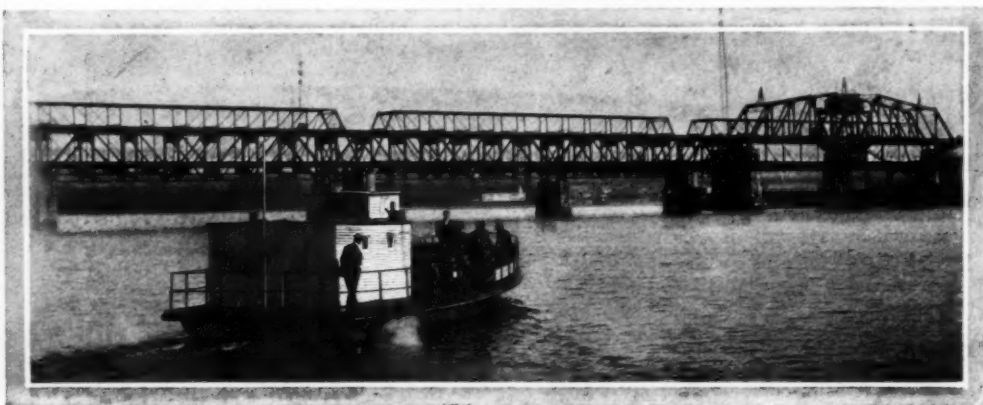
Chesapeake Bay, South of Havre de Grace.

The fare charged for carrying an automobile on this ferry is \$2, which seemed to us rather out of proportion to the distance traveled. However, as there is a decent pier and approach to the ferry at either side of the river, we did not complain.

It will not be long before the ferry at Havre de Grace becomes a thing of the past. The Pennsylvania railroad has recently built a new bridge at this point and has ceded its old bridge to the State (in return for the repeal of certain onerous restrictions in the company's franchise). As soon as a new center pier is built, which is predicted for November 1, there will be a fine highway for the use of vehicles. At the present writing the first highway bridge over the Susquehanna is at Columbia, and the majority of tourists traveling between Philadelphia and Baltimore go that way—probably because of the senseless tradition that there are some great difficulties in traveling by the direct route via Havre de Grace.

We spent the night very comfortably in Havre de Grace at the Hartford Hotel, taking our dinner at Herr Konigsberg's restaurant, where we were served with terrapin soup, oysters right out of the bay, chicken, and a few similar delicacies at the surprising price of fifty cents per head.

Before starting out in the morning we were joined by our old friend, L. W. Tremblay, of the Automobile Club of Maryland, who acted as our guide for the rest of the day's trip. We had not traveled far from Havre de Grace when the good roads reappeared, and we made quick time through Belair and



Ferry Across the Susquehanna River, from Perryville to Havre de Grace.

then to the beautiful Long Green valley, famous as the rendezvous of several hunting clubs. Even faster than the nimble fox runs before the pursuing hounds, we hastened through the valley to its terminus at Towson, and from there it was but a short drive into Baltimore (111 miles from Philadelphia).

Up to a year or two ago tourists usually made the trip from Baltimore to Washington by a roundabout way, via Ellicott City. Now a fine boulevard is under construction directly connecting the two cities. More than two-thirds of the road has been finished, and the tourist covers the intervening stretches of bad road with good grace, as he knows that, before another year has passed, the work of building the macadam boulevard between the two cities will be completed.

Only one incident marked our trip into the Capital City. Just as the tip of the Washington Monument came into sight we saw an automobile approaching us at a speed very much greater than that stipulated in the statute. As it flew past us we saw that it was a big White Steamer, in which sat its smiling owner, President Taft, with the members of his family. He acknowledged our salutes by tipping his cap with that display of camaraderie which is usual when White meets White.

We decided to spend the night at Washington, and devoted much of the evening to considering our further plans of "On to Richmond"—the cry which once thrilled so many hearts. We pored over the maps and discussed the pros and cons of the several possible routes to that city, just as must have been done in the dark days of 1861-1865 by those who had in their



keeping the destiny of the nation. But while it took the Union army four years to go from Washington to Richmond, we were determined that we would do it in one day. And we did so, although there is no record of the trip ever having been made before in a day by an automobile. No data has ever been published regarding the route which we covered, and, for that reason, the accompanying map will prove of special interest to those tourists who are not deterred by bad roads, particularly if the bad roads lead through an interesting section of the country.

Leaving Washington on Monday morning (the day after Easter) we crossed the long bridge over the Potomac River and continued parallel with the railroad into Alexandria. On the outskirts of this town we turned due south into the old "Telegraph road," so called because it is along this road that the telegraph wires run to Richmond. Although we made frequent turns during the day, we followed the Telegraph road practically all the way to Richmond, making a few detours here and there at places where we were advised that we could find better roads.

Nothing would be gained by considering the Telegraph road section by section. Almost all of it is bad and much of it is worse. However, I believe that it is only a matter of a few years when this road will be macadamized all the way from Washington to Richmond. But it is the touring conditions now existing of which we speak. There is very little level country in eastern Virginia, and the road goes up and down, up and down. The best roads which we found were of sand, on which,



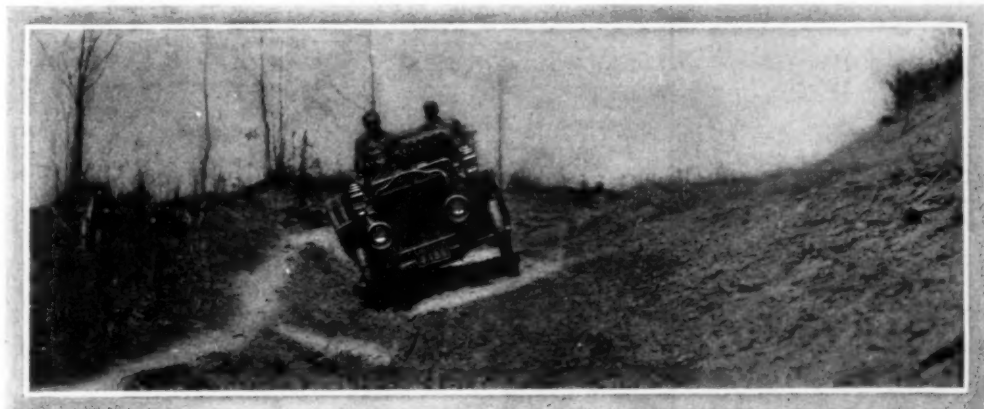
View of Long Green Valley, Near Baltimore.

Soon after leaving Stafford Court House the road improved a little, and we "crossed the Rappahannock" into Fredericksburg. On the summit of the hill just beyond this town we saw by the roadside a little monument, hardly two feet high, bearing the inscription, "Lee's Hill, Battle of Fredericksburg." How modest a memorial this is, we thought,

to the valor of the Confederate troops who, on this ridge, in the closing days of 1862, defeated the Union troops who were advancing on Richmond and drove them back across the Rappahannock with terrible slaughter. Surely, if every little Northern town can boast an elaborate Soldiers' Monument, Fredericksburg should have some more imposing memorial of the victory achieved there by the "Boys in Gray."

After we left Fredericksburg behind us the road seemed even

rougher than before. There were more creeks to be forded, but none of them was either very wide or very deep. In fact, considering how sparsely the country is settled, we were a little surprised to find substantial iron bridges over all the more im-



Typical Road Almost Anywhere Between Washington and Richmond.

by "straddling" the ruts and by opening the throttle a little wider than usual, we made almost as good progress as we had on the previous day. Even the worst roads made no difference to us except that we did not cover very much more than ten miles an hour. The roads were rough and washed out, and often each of the four wheels would be on a different level. We found many miles of corduroy road, in which the "corduroy" was missing every few yards. After dropping gently from the "corduroy" we would bring our car almost to a stop at the point where the "corduroy" began again. Then, opening the throttle wide, our car would climb to the new level—almost a foot above the old—without even jarring the passengers. But, of course, this kind of driving takes time, and instead of making Fredericksburg, the halfway point, for luncheon, as we had planned, we had traveled by 1 o'clock only as far as Stafford Court House (52 miles from Washington).

This community consists of a court house, two general stores, a jail, and a fine old-fashioned farmhouse, owned by the clerk of the court, Mr. Bryan. Mr. Bryan's claim to local fame is that he is a cousin of "William J.," the Presidential Marathon runner. However, we shall remember the Bryans of Stafford Court House as the providers of as fine a luncheon as was ever set before a party of three hungry tourists; price (for the three), "A dollar—if that is not too much." I think, too, that they will remember us as having given them their first automobile ride (twelve in the car).



Along the Banks of the Occoquan River.



After Lunch with W. J. Bryan's Cousins, Stafford C. H.

portant streams. After our travels in Georgia, a year ago, we were prepared for anything in the fording line and were, if anything, a little disappointed that we did not find any deeper water on our route.

There is an end to all things—even to a Virginia bad road, and about the time our speedometer registered 95 miles from Washington we were on a road which would have passed inspection



Old House Near Fredericksburg, Riddled with Bullets.

in central New York by the standards prevailing four or five years ago. Just as daylight was fading we reached the little town of Ashland, and here we stopped to light our lamps. We could not get our acetylene lamps working, and, therefore, drove into Richmond by the light of our oil lamps, which, of course, would have been inadvisable had the roads not been in very fair



White Steamer Fording a Stream Near Ashland, Va.

condition. We reached Richmond in time for a late supper at the luxurious Hotel Jefferson, 125 miles from Washington and 375 miles from New York. Thus, without a single involuntary stop, even for tires, we had traveled from the metropolis to the old capital of the Confederacy in practically three days and had passed through five States—New Jersey, Pennsylvania, Delaware, Maryland and Virginia. A journey of this character emphasizes the utility of the auto as an up-to-date form of travel.

#### When Richmond Was Reached We Took Our Ease.

At Richmond I found myself once more in a country which I had previously covered (reaching there via the Shenandoah Valley), and, therefore, decided to terminate the trip, as we were once more beginning to think about telephone calls, unanswered letters, and those other things which, in this imperfect world of ours, intrude upon the mind and time of the tourist. We spent much of the following day in driving around Richmond and its suburbs, and late in the afternoon turned the car over to the Old Dominion Line for shipment back to New York and returned by train, each of us wearing a coat of tan that would do credit to a Glidden tourist the third day out from Kalamazoo.



#### MOTOR PARKWAY RE-OPENED TO TOURISTS.

NEW YORK, April 19.—After being closed to automobilists during the last two months, the Long Island Motor Parkway was opened on last Saturday. At present the Meadow Brook lodge, situated near Garden City and the Meadow Brook Hunt Club, at Westbury, is the only entrance and exit, and cars may pass through it between the hours of 8 a. m. and 7 p. m. on Saturdays and Sundays. Active construction on the course has progressed during the Winter, the right of way having been cleared of trees, and the grading, bridging, fencing and roadmaking east from Bethpage to Lake Ronkonkoma and west from the Meadow Brook lodge to the Queens-Nassau line are receiving attention now. Within a short time extra gangs of laborers, concrete mixers and steel workers will be employed.

#### WOMEN TO RACE IN FAIRMOUNT PARK.

PHILADELPHIA, April 19.—Permission has been granted by the Fairmount Park Commissioners for an automobile obstacle race to be held by the members of the Movoganto Klaubo, a body of enthusiastic women automobilists. No date has as yet been set.



# What the Glidden Pathfinder is Finding



CHICAGO, April 17.—Guard well your thermos bottles, ye Gliddenites given to acquiring a thirst which the town pump will not quench. Note carefully that these receptacles for goat's milk, bubble water, and other elixirs of life blow cold when you leave Detroit on the morning of July

12 next, for they must needs serve as oases in many an arid waste.

It isn't that Michigan will be lacking in vernal beauty. Nature has dealt kindly with the Wolverine State across which Glidden tourists will wend their way in Midsummer. For much of the way the route selected by Pathfinder Dai H. Lewis leads the tourist across rippling brooks and past sylvan dells where lakes of crystal clearness nestle, delighting the eye, but—

It was a raw April morning, with one of those winds that chills to the marrow blowing a gale, when the E.-M.-F. "30" bearing Pathfinder Lewis, E. LeRoy Pelletier, of the E.-M.-F. Company, Official Photographer Krohn, the driver, and the "Innocent Bysitter," trundled into Paw Paw, a thriving village of 1,600, after plowing a course for some hours through a sea of mud caused by a combination of rain and snow.

"At last," murmured Pelletier, who after the exposure to which he had been subjected resembled an animated iceberg more than anything else.

With a deliberation that was exasperating under the circumstances, Lewis clambered down from his seat beside the driver, ambled across the road, and dragging a ruralite to one side talked earnestly with him for a moment. Then he returned to the car.

"He says he doesn't know, but we might try the hotel," said Lewis, as the car sped forward.

Two blocks further and a halt was made at the village inn, where the landlord, sans coat and vest, was standing on the walk superintending the unloading of a sample trunk. Laboriously a quintet of chilled travelers made their way over to the local boniface, and Pelletier, acting as spokesman, propounded the fateful question.

"Gosh all hemlocks, no," ejaculated the astonished landlord, in tones that were plainly audible across the street. "You can't get a drop of whiskey in this town for love or money. This is a dry county, you know."

Sadly five pairs of eyes were turned in the direction of the car, where reposed two empty thermos bottles, the filling of which at Kalamazoo, the last life-saving station passed, had been overlooked.

Then the watchful Pelletier was seized with an inspiration.

"Come on, fellows, we'll get something," said he, leading the procession to a shop a few doors distant, where a sign announced ice cream soda and soft drinks.

"Land sakes, no, we won't have no ice cream soda for two months yet," was the comforting information handed out by the proprietress of the shop, who had emerged from a rear room wiping her steaming hands on a kitchen apron. "We ain't got

no soft drinks, neither." This proved to be a true statement of fact, and for once the redoubtable Pelletier was nonplussed. Ten minutes later when we left the shop, after investing in a number of souvenir post cards, he was standing on the sidewalk in front of the village grocery eagerly devouring a quart of half ripe strawberries in a vain endeavor to assuage the thirst that had been growing with startling rapidity ever since it was discovered that Paw Paw was not an oasis.

There were other points along the line where similar attempts would have been equally fruitless, but no further effort was made. By July these dry spots will be still more numerous, at least two large counties through which the Glidden tour will pass having gone strongly for local option at the recent election, with the result that even blind pigs and speakeasies will be hard to locate after May 1.

Whether premeditated or purely accidental, it happens that the first night's control at Kalamazoo is located in the wet belt, although Battle Creek, only a few miles away, will be dry. Not that this will matter to the Gliddenites, for they are proverbially abstemious; but there seems to be a deal of satisfaction in being in touch with a base of supplies at all times, and the presence of even a well-stocked thermos bottle has been known to ward off thirst just as surely as inability to secure wet goods creates a desire, all of which goes to prove the axiom that a bottle of prevention is more efficacious than a barrel of cure.

Sometime, somewhere, I had read or heard that pathfinding was great sport. Fortunately for the author of that statement, I am unable at this time to recall either his name or address. I



An Illustration Which Tells Its Own Story.

know better. There may be latitudes in which at this season of the year you can drive across country day after day without suffering inconvenience. There is at least one where you can not, as I learned to my entire satisfaction.

When you face biting winds hour after hour as the car speeds along, encounter clouds of sand that at times hide the road from view, splash through mudholes hub deep, and battle with a driving snow that makes progress next to



under water." After due deliberation, we decided not to go through the swamp road, and fifteen minutes later learned that had we followed the instructions given we would have been far off the course. But the natives are a sociable lot, and you are given a hospitable reception wherever you stop.

If asking questions was all there was to it, pathfinding would not be such an irksome task. That is only an incident of the journey. With pencil and pad in hand, Lew-



impossible, all within a few hours, you begin to realize that pathfinding is no sinecure, and your envy of the men entrusted with the task shrinks appreciably. Add to this the joy of piling out of the car in mud ankle deep, picking your way over to a farm house where you are greeted effusively by an underfed dog who loses no time in indicating a desire to feast off your calves while you endeavor to pacify him, knocking at the door, awaiting the arrival of the entire household, and then, after you have shivered and shook for a little matter of five minutes or so, discovering they are unable to enlighten you on the point in which you are in doubt, and you appreciate as never before what such a trip as this means.

"Some folks says it's three an' a half miles, some says it's four, some says it's four 'n a half, an' there's others says it's five. I dunno how far it is," was the interesting information vouchsafed by one woman in answer to an inquiry from Lewis.

"Which road is the best?" inquired Lewis, urbanely.

"The swamp road that runs down past here, leastwise most folks says so, but I don't know," came the non-committal reply.

Back in the machine again, Lewis gave the word to proceed, when in shrill feminine tones there came the cheering announcement:

"You can't go through the swamp road, though. The bridge is busted down, and the road's all



is sits beside the driver for hour after hour, taking down the mileage and distinguishing points as the car spins along, and at night transcribes his notes for use in the official guide book that next Summer will describe the course so clearly that the veriest amateur could not go wrong. There are photographs, hundreds of them, taken by the way, and these will show every turn to be made.

Next July, when the Glidden tourists leave Detroit on their way to Denver, conditions will be ideal, and there will be no suggestion of hardship. Neatly printed guide books will tell them where to go and what to do. They may marvel at the completeness of the book, but they will have no conception of what its compilation meant, of the long, cold rides, the endless detail, the vast amount of labor involved.

If they knew what I know about pathfinding—but they will not, so what is the use of dwelling longer on that point? And it is because of what I know regarding pathfinding that I am not envious of Lewis and associates on their trip to Denver. LEN G. SHAW.

### DELAWARE RUN.

WILMINGTON, DEL., April 19.—The Delaware Automobile Association has decided to hold an endurance run during the latter part of May. The route will probably be to McCall's Ferry, Pa., along the Susquehanna River.





## PATHFINDER IS PLOUGHING THROUGH THE WISCONSIN MUD.

**B**UFFALO, N. Y., April 20.—The Glidden pathfinding expedition is by this time well on its way to Minneapolis, on the latter part of the first leg of the tour, and about a quarter of the total distance has been mapped out in shape to go in the official guide book. Starting from Detroit on April 12, the party stopped the first night in Jackson and the second in Kalamazoo, which is to be the first night stop of the contestants. On the third day the route-layers made South Bend, Ind., and on Thursday reached Chicago, the second night stop of the real tour. From the Windy City the path-finding car proceeded to Madison, Wis., which is to be the third overnight stop.

The pioneers are making a more careful survey than ever this year, owing to the unfamiliarity of the country which is to be traversed. The route will be entirely new to the Glidden tourists of former years, with the sole exception of the stretch between South Bend, Ind., and Chicago, which was covered in 1907. Frequent stops are made to take pictures, as all the important turns and forks are to be illustrated in the guide book. The roads have been found very muddy, but their character promises better conditions in July.

The present plans for the tour call for a period of about eighteen days and a distance of about 2,000 miles. There will be two intermissions of two days each, however, one at Denver and the other probably at Minneapolis. Denver automobilists are reported to be raising a fund of \$10,000 for the entertainment of the tourists, so the weary wanderers may look forward to a good time on the Saturday and Sunday to be spent in that city.

It will be noted that both the time and the distance are a little longer than for any former tour, and this is expected to afford a more strenuous test of the cars. However, the plans are as yet tentative and subject to change, as it may be discovered that some of the trips are impracticable. No official announcement will be made until Mr. Lewis has completed his survey.

Arrangements for the night accommodation of the tourists are already being perfected, especially for the ten days in which they will be housed and fed in Pullman cars. This is expected to be a welcome novelty, as the accommodations will all be equally good and the price will be determined and paid in advance, and the "knockers" will have no chance to complain of uncertainty and overcharging. There will be many of the features of camping out, without the disadvantages, for often the Pullmans will be found on sidings out in the prairies, where the coyotes will sing their lullabies.

Although a few still favor rules that permit a number of cars to be tied at the finish with perfect scores, there are more manufacturers who welcome the conditions of a true contest, in which it is certain that a definitive winner will be evolved. In fact, many would favor rules so strict as to leave no perfect scores at all, the car with the least penalization to be the winner. No one expects a car to cover 2,000 miles, over all kinds of roads, without the least stop or adjustment, and the granting of a dozen or more so-called "perfect scores" under such conditions is only a source of criticism.

The greatest value of a cross-country tour is to show the public how the cars stand up under the most strenuous usage, and an unrestricted race in which a car may be secretly rebuilt several times over is of no advantage to anyone. It is of the utmost importance that the cars travel on a rigid schedule and that a close account of all repairs be kept. Moreover, the closer the contest the more interesting it will be, and the more valuable will be the publicity obtained. Charles J. Glidden, the donor of the trophy, will accompany the tourists this year, as usual, riding in the Premier pacemaking car with Chairman F. B. Hower.

Entries at the regular fee will close May 15, the earliness of the date being due to the many arrangements to be made for the accommodation of the party. Entries made up to June 15 will cost \$100 extra, but positively no post entries will be received.

## NEW PHASE IN THE NEW YORK TO SEATTLE CONTEST.

**I**T is barely possible that changed rules and manufacturers' approval in the endurance contest from New York to Seattle may result shortly, if rumors emanating from responsible sources materialize. Great opposition has been found by Mills & Moore, the Eastern managers, to certain provisions in the rules announced, and the lack of regulations of speed and interchangeability of parts, so these may be altered to suit the manufacturers who voted against the event. If this is done it is probable that the members of the Manufacturers' Contest Association may raise the ban placed upon it, although not necessarily entering. Following a visit of John Kane Mills to Detroit, Tuesday, came the report that the manufacturers have been asked by letter from the chairman of the rules committee, H. E. Coffin, whether the matter of the trans-continental contest shall be reopened. A daily schedule of 200 miles as far as Denver, and then go-as-you-please, are the changes suggested.

In the meantime the Thomas pathfinder is battling with snow,

deep mud, broken bridges and no roads at all, in Wyoming. It left Denver on Wednesday of last week, reached Cheyenne that evening over good prairie roads; pushed through 40 miles of snow to Laramie on Thursday; 91 miles to Hanna on Friday, the first 71 of which, to Medicine Bow, was good, and the remainder nearly impassable; 20 miles to Rawlins was sufficient work for one day on Saturday; Sunday was spent in Rawlins while a gang of laborers by the order of the road commissioner tried to make some of the roads west passable; and, Monday, Green River was reached. The road conditions have been such as to almost prevent movement, but it is expected that they will be better in Idaho and Washington, where State appropriations of \$50,000 and \$125,000, respectively, have been made to improve the roads for the contest.

Enthusiastic receptions have been accorded the crew by automobilists and authorities, and they have been accompanied by pilot cars since leaving Denver.

### DEATH OF GEORGE P. DICKEN.

**P**ARIS, April 17.—George P. Dicken, well known to many American automobile visitors to Europe as the automobile and aeronautic reporter of the Paris edition of the New York *Herald*, suddenly died recently at Monte Carlo, where he was reporting the motor boat races. Mr. Dicken was the first to obtain and tell of the European success of Wilbur Wright, and consequently secured a notable beat for the *Herald*.

### GEORGE B. SELDEN IS MARRIED.

**R**OCHESTER, N. Y., April 19.—George B. Selden, president of the Selden Motor Car Company, and licensee of the Selden patent on automobiles, was married to Miss Jean Shipley on last Wednesday morning. The ceremony took place at the home of the bride in this city, and immediately thereafter Mr. and Mrs. Selden left for an extended tour. As a wedding present the bride received from her husband a 1909 Selden touring car.

### GIANT'S DESPAIR ENTRY BLANKS ISSUED.

WILKES-BARRE, PA., April 19.—An even dozen events will constitute the fourth annual hill climb of the Wilkes-Barre Automobile Club, as shown by the entry blanks which have just been issued. Under the sanction of the A. A. A. and with the understanding that the contest on Giant's Despair, the Wilkes-Barre Mountain, will be the national event of its kind, this will be held on Monday, May 31. The classification has been made according to price and piston displacement, as laid down in the rules of the national organization, and the contestants will be divided into seven sections, according to price; two by piston displacement; one free-for-all, and two special classes, one for members of the local club and one for Quaker City Motor Club visitors.

The regulations under which the affair has been held in the past successfully will be in force this year. The course, which is 6,000 feet in length, with a rise of 700 feet, giving a grade varying from 11 to 22 per cent, will be guarded by efficient police, probably the famous State Constabulary. The contestants will all be given a flying start and none will be allowed to descend until each event is over. An electric timing system will be installed and guaranteed to operate. The Hollenback trophy, offered to cars whose piston displacement is between 301 and 450 cubic inches, will be one of the principal prizes and it must be won three times to secure it for permanent possession.

The entries will close on May 26, with George F. Lee, chairman of the contest committee. The fee for each event has been set at \$15. The list of events follows:

- Event 1—Gasoline stock cars, selling for \$850 or less.
- Event 2—Gasoline stock cars, selling from \$851 to and including \$1,250.
- Event 3—Gasoline stock cars, selling from \$1,251 to and including \$2,000.
- Event 4—Gasoline stock cars, selling from \$2,001 to and including \$3,000.
- Event 5—Gasoline stock cars, selling from \$3,001 to and including \$4,000.
- Event 6—Gasoline four-cylinder stock cars, selling for \$4,000 or over.
- Event 7—Gasoline six-cylinder stock cars, selling for \$3,000 or over.
- Event 8—Free for all. Cars of all types and motive power.
- Event 9—Gasoline stock chassis with piston displacement of 451 cubic inches, not to exceed 600. Minimum weight, 2,400 pounds.
- Event 10—Gasoline stock chassis with piston displacement of 301 cubic inches, not to exceed 450. Minimum weight, 2,100 pounds.
- Event 11—Cars owned by members of the Quaker City Motor Club only.
- Event 12—Cars owned by members of the Wilkes-Barre Automobile Club only.

### ALL DIXIE NOW WANTS AUTO RACES.

ATLANTA, GA., April 19.—Successes at Savannah, Daytona, Atlanta, New Orleans and other cities, have stirred the whole South into a racing craze. The complaint long ago infected the large cities and now the small towns have been reached. The latest candidate is Fitzgerald, Ga., a town founded not many years ago by G. A. R. veterans and their families and now numbering perhaps 3,000 citizens. A three-days' meet has been scheduled for June 8, 9, 10, and according to report "500 cars are expected to take part."

### SAVANNAH HOPES FOR GRAND PRIZE.

SAVANNAH, GA., April 20.—At a meeting of the executive committee of the Savannah Automobile Club action was taken, giving authority to the chairman to request the Automobile Club of America for early advice as to whether another Grand Prize race is to be held, and if Savannah will be the scene of the event. Not until the A. C. A. is heard from will the Savannah club take any further steps toward the race.

### BRITISH DOUBT OF FLORIDA RECORD MAKING.

One of the leading English publications, *Motor*, prints a picture of George Robertson, the well-known driver, and, while calling attention to his Florida time trials at the wheel of the Benz car, cannot resist the temptation to insert in parenthesis that "it is alleged" the figures were made. The particular reference is to the five miles which the Benz covered in 2:45 1-5.

### RULES FOR NEW JERSEY RUN ANNOUNCED.

NEWARK, N. J., April 19.—Rules requiring above all things a strict observance of the automobile laws of the State have been announced by the race committee of the New Jersey Automobile and Motor Club, to govern its endurance contest, May 22. Open only to amateurs, the regulations are of a nature new to this part of the country, although conforming to those of the American Automobile Association. Penalties for arriving at the two controls ahead of time, for work done on the motor, and for stops en route, with observers on each car, are provided for.

The event may be entered only by owners of automobiles who are club members in no way connected with the trade, and the cars must be driven either by the entrant or one of the immediate family, no chauffeurs or mechanics being allowed at the wheels. There will be three classes: A, for cars to and including 20 horsepower; B, for those from 21 to and including 30; and C, for those of 31 and over. In addition to the driver and observer, who will occupy the front seats, the full complement of passengers must be carried, and in the case of touring cars, there must be one person for each 18 inches of the width of the rear seat. The driver will be the only one allowed to make adjustments, except to tires, unless permission is secured from the observer, and then the time of the other persons will be charged against the car at double rate of, and in addition to, that of driver.

The route as suggested has been adopted, going to Hackettstown via Chatham, Madison, Morristown, and Schooley's mountain, and returning via Stanhope, Dover, Montclair and East Orange. This circuit is 95 miles in length, and must be covered twice, checking at Newark and Hackettstown each time.

The substance of the penalty list as announced is as follows: To arrive at Newark more than three minutes ahead or behind time on either circuit, 2 points; to stop the motor without making repairs or adjustments, 3 points; to stop the motor to make repairs, adjustments or replacements, 2 points; to stop the car on either circuit after leaving Dover, unless in case of tire trouble, exceptions made when held up at railroad crossings, or for other reasons beyond the control of the driver, 3 points; to repair or make replacements or adjustments, with motor running, 1 point; to replenish with oil or gasoline at any other place than the clubhouse in Newark or the American House in Hackettstown, 1 point. Driving the car in circles in order to delay the arrival at the Newark control will be penalized 2 points. Entry blanks may be secured from the club secretary, A. B. Le, Massena, 64 Park place, Newark.

### BUSES BARRED FROM RIVERSIDE DRIVE.

The recent action of the Board of Park Commissioners, of New York City, in debarring the Fifth avenue motor buses from using Riverside Drive, has aroused much indignation. The company started the service in response to the popular demand, but has been obliged to suspend it temporarily.

One of the leading landscape architects expressed himself as in favor of the service, saying that the trees should be trimmed to a height of eighteen feet from the road surface as in Paris and other European cities. Harold A. Caparn, treasurer of the American Society of Landscape Architects, is also favorable to the trimming process, and placed himself on record as follows: "The fact is that Riverside Drive is a public parkway, and should therefore be made available to the public as fully and freely as possible, consistent with the proper preservation of its beauties which constitute the greater part of its usefulness. I sympathize with the Park Commissioner, and commend him for his zeal, but his enthusiasm conflicts with public interest."

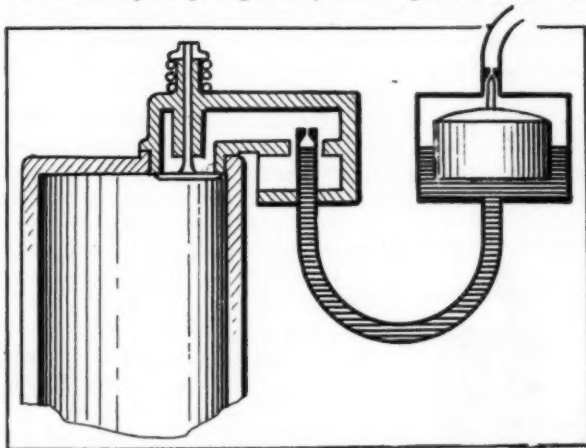
In the interim, the people in the neighborhood, who encouraged the installation of the service, are anxiously awaiting the outcome. It is urged in favor of the motor bus service that the increasing demand for transportation facilities in that part of the city may result in the establishment of a street car line on the drive, which would destroy its value as a beauty spot.



# What to Do When the Carbureter Won't Work

by Morris A. Hall

A CARBURETER is a device for vaporizing liquid fuel. The fuel ordinarily used in the automobile engine is gasoline, and the majority of carbureters are arranged to convert this into a gas. This is done by mixing air with it. Air is used because the fuel itself lacks sufficient oxygen for complete combustion, and air is the cheapest oxygen carrier at hand. If gasoline were self-sufficient, neither air nor other oxygen carriers would be necessary. In that case, the fuel could be vaporized in a closed vessel by simple agitation, such as paddles would afford.



Scheme of Operation of the Original Maybach Carbureter.

The carbureters now in use attain this result in a variety of ways. The early devices were mainly of the surface type, in which the air passes over the surface of a body of the fuel, picking up some of it. Another early form circulated the air around gauze, wicking, or other surface saturated with fuel. Both of these methods are in use to-day, but in combination, and not as the sole source of gas. Thus, Benz used a vaporizing device of this sort on his earlier machines.

Another very old method is called the ebullition or filtering carbureter. In this air is forced through a body of liquid, entering at the bottom and in its passage to the top absorbing small particles of the fuel. Daimler began with this style, but later abandoned it in favor of the Maybach float feed spraying arrangement, which was the prototype of the form now in prevailing use. The filtering scheme is, however, still used.

A fourth basis of operation is the spraying or atomizing of the liquid through a very fine nozzle, being picked up in this form by the intruding air. The common variety is of this kind. The first of this type, the Maybach, as shown in the figure, was remarkable, in comparison with its modern successor, principally for its simplicity. There was a float, controlled by the amount of liquid, and a nozzle. The air entered around the nozzle and mixing with the fine spray of fuel in a chamber directly above the cylinder, was drawn from there into the combustion chamber. Although simple, it was also crude and the heat from the cylinder doubtless had much to do with its success. The nozzle was large, as such sizes go to-day, but in spite of all these defects it worked, and worked better than anything that preceded it.

**Defects in the Original Are Not Found in Modern Types.**—The original had no adjustment, the opening in the casting measured the amount of air, the size of the nozzle measured the amount of the fuel and the fineness of the spray; there was no means of regrinding the float valve, and thus no way of assuring an even and continuous flow of fuel. The modern adjuncts

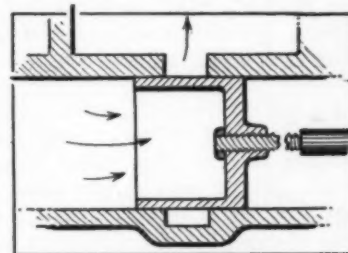
of the original Maybach device consist of remedies for these defects, and, in addition, a proper means of balancing the float.

To pick out a modern carbureter at random, take the one shown. Like its ancestor, this has a gasoline chamber into which the fuel is admitted by the action of a float, first passing through a strainer. From the float chamber the liquid passes up to and through the spraying nozzle. The weight of the float is so calculated that the level in the final nozzle is just 1 millimeter (0.04 inch) below the top. This insures that there will always be fuel there for the air suction to draw off. As the chemical action of changing a substance from a liquid to a gas is usually accompanied by the absorption of heat it is advisable to supply a reasonable proportion of this and in that way assist the change of form. In the older Maybach, this was inadvertently done by placing the whole apparatus in close contact with the hot cylinder. In the modern carbureter, placed some distance from the heated portions of the engine, this additional heat is supplied by the jacket water. An alternate scheme is to preheat the air supply by a special pipe from the exhaust manifold.

From this mixing chamber the mixture of air and gasoline vapor passes upward into a secondary mixing chamber. This communicates with the inlet pipe through the medium of the throttle valve. Into the latter chamber, the auxiliary air supply (when used) has access, through the auxiliary air valve. This comes into action on very high speeds when the engine is pulling very strongly, for which the proportion of gasoline to air is liable to be too large, so the auxiliary opens, admits more air and thus dilutes the mixture.

Whatever the character of the resultant mixture, it is admitted to the cylinder by the throttle valve, which takes the form known as the butterfly. This is but a flat piece of sheet metal, preferably brass, attached to a suitable shaft with an operating lever on the external end.

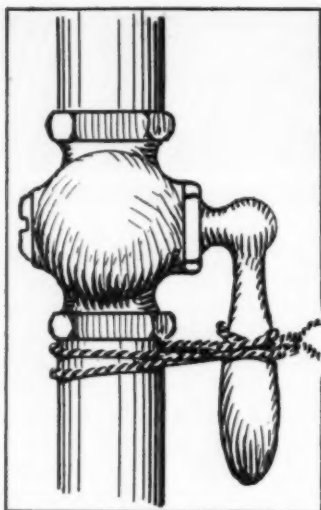
**And Then the Trouble Begins.**—Fuel and carbureter troubles begin with the first turn of the starting crank. The cylinder is cold, so no heat is available to assist in vaporizing. It is impossible to turn the motor over very fast by hand, so that there is very little suction, tending to draw the mixture into the carbureter. This trouble leads to what is known as priming. It is the act of introducing by hand, or independently of the carbureter, gasoline in a form that is readily vaporized. It may be squired into the cylinder head, directly, through the suction inlet valve (if one is used), through the pet cocks on top of the cylinder, or otherwise. To do this, an oil can may be kept on hand, full of gasoline, and reserved for this purpose. Or a rag or piece of waste may be saturated with the liquid, held over the desired opening



Throttle Stems Sometimes Part.



Typical Butterfly Throttle Parts.



A Little String Saves Trouble.

and the fuel squeezed out. These remarks apply mostly to old-fashioned motors, but can be used in the case of a very stubborn customer of more recent date.

The modern engine starts so readily, however, that such precautions are not necessary. All carbureters are fitted with a device called a priming lever for this particular purpose. The action is to raise the float off of its seat, allow more gasoline to flow into the float chamber, thus raising the head effective for causing a flow at the nozzle, and, from this, the desired result that the gas flows more readily and the motor starts easier. If the prime does not work, prime by hand.

**Engine Should Start on the First Turn.**—So if all conditions are right, the carbureter is primed and the engine will start on the first turn of the crank. If it does not do so there is a source of trouble which must be remedied first and it is useless to continue cranking. This may lie in the fuel system itself, but exterior to the vaporizer, or it may be in the ignition apparatus. It is well in a case of this sort to start with the gasoline tank and follow the fuel through each step until it apparently reaches the combustion chamber in the form of a properly proportioned mixture of gasoline and air.

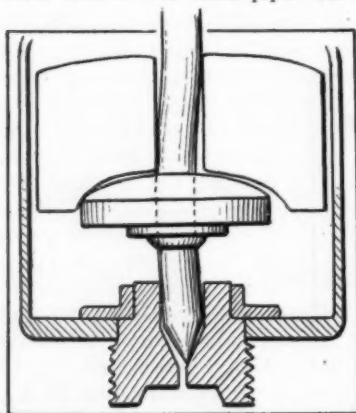
To start with the tank, is there enough fuel in it not only for starting purposes, but enough to allow of making the proposed trip? This is readily ascertained by unscrewing the filler cap and inserting a measuring stick. For the purpose a graduated rule is good, but not necessary; any stick or small branch of a tree will answer, or, lacking all these, a piece of wire can be used. A string tied to a very small weight would also do.

Having verified the presence of fuel, the next question to ask yourself is: does it reach the vaporizer as it should? Nearly all carbureters have a drain cock at the lowest point. Open this and if fuel flows out in a steady stream you can be sure that the pipe from the tank up to this point is not clogged. In case the carbureter does not have a drain cock, the same result can be effected by holding the primer for a long time when the gasoline will overflow through the air inlet.

In either case, if there is no sign of gasoline when the tank contains plenty, it is apparent that the feed pipe is clogged and the method of procedure is as follows: Shut off the cock below the tank so that none of the precious liquid can escape, then drain off the carbureter and pipe into a handy pail. Next open the union below the cock in the feed line and the one at the other end of the same pipe. At both places look for obstructions.

Then clean the pipe out thoroughly, using flowing water, a piece of wire or other means which are available at the time.

**Gasoline Strainer Is Often a Source of Trouble.**—Finding nothing here, it will be necessary to continue the search. Look in the strainer of the carbureter to make sure that the flow is not stopped there by the accumulation of dirt and grit, filtered out of the fuel. This should be



Look for a Bent Needle Valve.

cleaned often, but like many other dirty jobs is "postponed" from time to time.

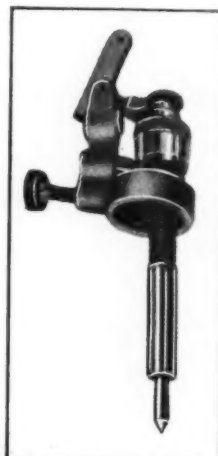
Should this source of trouble prove "not guilty," the carbureter itself becomes an object of suspicion. Is the float jammed down upon its seat or are there obstructions there which prevent the flow of fluid? Is the float punctured, or has one of the soldered joints, if a metal one, opened, or is it fuel-soaked, if cork?

**A Bent Needle Valve Stem Raises Hob.**—To attend to this sort of trouble disconnect the priming arrangement, take the cover off of the float chamber (it usually is screwed on with a right-hand thread), and take the float out. An examination of the float will disclose if it is at fault in any of the above-mentioned ways, all of which are comparatively easy to fix. If the float was jammed down, perhaps by priming, the act of taking it out will cure that, provided that the stem of the float is not bent and the needle valve or its seat not injured. If the seat is scored it should be ground in just like any other valve using oil and fine emery. A fuel-soaked cork should be thrown away if another is at hand to replace it, but if not, the cork float should be moved in its position on the stem so that it sets higher in the liquid. In other words, move the cork a sufficient amount to compensate for its loss of buoyancy.

In the case of a punctured float of metal or loose solder, the only real remedy is to resolder in either case. It usually happens that a soldering outfit is not available out on the road and some form of makeshift will be necessary to allow of reaching

a place where a soldering iron may be had. If the puncture is on the bottom, it is sometimes possible to accomplish this by inverting the float so that the hole comes at the top. Here the gasoline seldom reaches and if the flow be reduced to make sure of this, it is possible to get to a soldering iron.

A remedy which might be tried in an extreme case of this sort is to fill the float to make it heavy, so that it will have a tendency to sink. Then take a small diameter spring, cut off a short piece of it and place it in the float chamber so that it opposes the sinking action of the now-heavy float. By carefully determining the length, and thus the strength, of this spring, the same action is obtained as would be had if the float were working all right. Of course, if the entrance of the liquid



Showing the Delicate Needle Point.

fuel is such that the sinking of the heavy float tends to close rather than open the gasoline inlet, the spring would have to be on the bottom and fairly strong so as to oppose the action of gravity. But if the float works downward to open the gasoline passage the spring will be at the bottom and very weak, simply being there to prevent an excessive flow.

**Look Out for a Throttle Loose on Its Shaft.**—Now the carbureter trouble has been reduced to a minimum. The remaining troubles might be centered in a clogged spraying nozzle. But this nozzle is readily removed, and with it the trouble, if that be the offending member. If the spray is proven O. K., the throttle is ready for attention. If of the butterfly type it may have become loose on its shaft, or what is the same thing, the operating lever may be loose. In either case the shape and weight are such that it would swing into such a position as would cut off the entrance of gas to the inlet pipe and thus to the cylinder. If the throttle is of the circular sliding or piston form it may not be connected to the throttle rod, but stuck in such a position as to prevent the passage of gas. This sometimes happens when running, and then, apparently, closing the throttle does not stop the engine. The writer had this happen to him once at a time when it was absolutely necessary to stop. The only way that trouble was averted was by the instantaneous closing off of the switch and the application of the brakes.

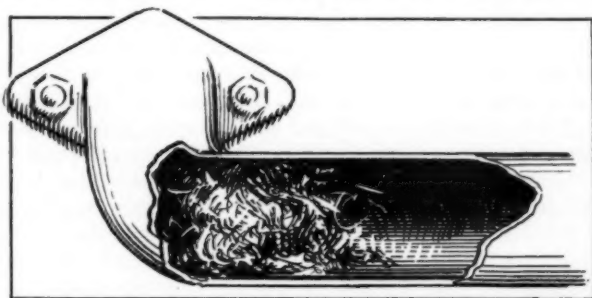


The last hope of finding trouble in the carbureter system rests with the inlet pipe. If no other trouble is found, take this off in search of misplaced waste or similar substances. The size of the pipe is such that anything in it large enough to cause trouble can be seen instantly and removed easily.

The valve or cock controlling the flow of liquid from the tank should be examined frequently and care taken to keep it in good shape. It must act hard and must be tight, so that no gasoline flows when it is supposed to be shut off. The reason for having it act hard is to prevent it jiggling shut after a long run. This is a real source of trouble, as the engine will gradually slow down and stop without any apparent source of trouble until the tank is looked at when the supply is found to be shut off. A method of fixing it, which is not to be recommended, however, is to open the cock and then hammer the handle so as to jam it tight against the seat, but in the open position.

This makeshift will answer until a place is reached where the taper seat can be reground or tightened in place, if that is what it needs. In case the driver did not wish to do this, and the cock was of the two-way type, open when the handle is parallel to the axis of the pipe, it could be tied in the open position by passing a cord around the cock and pipe both.

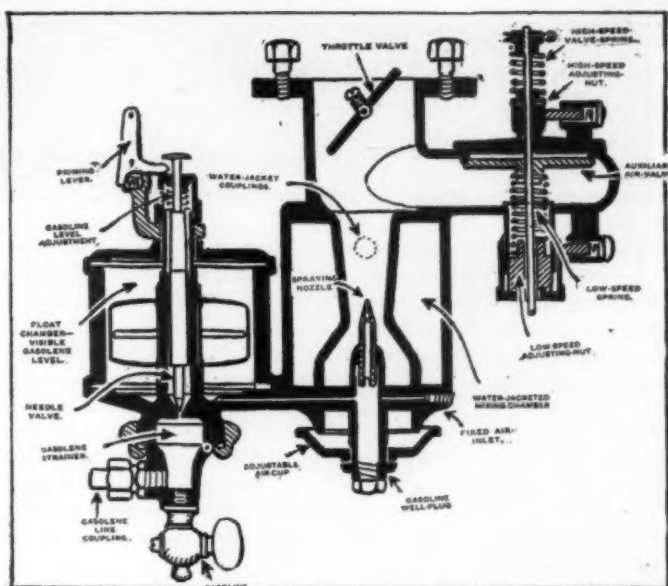
**Water in the Gasoline Causes Cuss Words.**—In all phases of gasoline systems trouble there is the possibility of water in the fuel. This may be proven by drawing off a little of the liquid into the palm of the hand and spreading it out into a thin even layer. If gasoline, it will vaporize in a few seconds, say, ten, according to the thinness of the layer and the quality of



Waste in the Inlet Pipe Upsets All Calculations.

the "stuff." If it does not pass away as a vapor, leaving the hand very cold, within a minute, one is safe in saying that water is present. Another good way to detect the presence of water in the gasoline is to spread some of the suspected mixture over a flat, clean plate, preferably of sheet metal. The gasoline will spread out in a very thin, even sheet, but the water will not. Globules of water will stand up above the thin level of gasoline and thus betray the presence of the objectionable liquid. If this test is worked out carefully and tried several times, particularly in conjunction with the first named test, it is possible to find the impurity every time. A little practice will give the new operator skill in this direction which will come in handy, in time of trouble on the road, when obliged to buy inferior fuel. A very fine screen of brass will intercept some, but chamois will take out all of the water. In a bad case of this sort the quickest way to remedy it is to draw off all the fuel into a pail, and then, in putting it back into the tank, pass it through a piece of chamois. In a mild case it will sometimes suffice to drain the carbureter only.

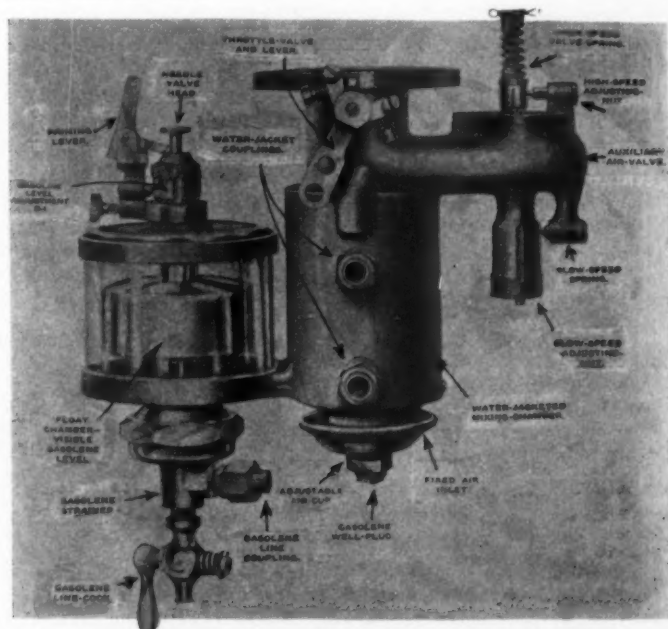
This feature is of more importance than is ordinarily thought, as a single instance will suffice to show. A car with a pressure tank at the rear of the chassis had the pressure valve fail to work, with the result that the bottom of the tank blew out at an isolated place far from repair and supply stations. With it went the gasoline, of course. An examination of the remains of the tank revealed the fact that the water in the fuel, being heavier, had gone to the bottom, and, lying there in quantity, had rusted through the iron tank, making it so weak that it readily yielded to a little excess of pressure.



A Typical Modern Carburetor Shown in Section.

It might be thought that the driver, without gasoline or a tank to put it in, was stalled, but such was not the case. A walk of a mile brought him to a trolley line. A nine-mile ride on this reached a place where gasoline was to be had. Returning with a five-gallon can of fuel, the small outlet at the top was connected by means of rubber hose to the end of the fuel-supply pipe. After inverting and punching a hole in the bottom with a nail, for an air vent, the driver reached home by holding the inverted can in his lap or on the seat beside him, the gasoline flowing to the carburetor by gravity. This is an extreme case, but shows what can be done by determination and head-work.

The two cuts, one above and the other below, show a typical modern carburetor, picked out at random, to illustrate to the novice the various parts. The upper view shows a cross-section and the lower an external view. The various parts are all marked with their proper names, the same parts being named in both views. It will be noticed that the mixing chamber is water jacketed; this is not applied to all carburetors; in fact, this particular make may be had without it if the driver so desires it. The parts previously referred to will all be found in these cuts and properly marked with the name by which they have been called.



View of the Same with Parts Properly Marked.

# Automobile Gasoline and Other Available Fuel

By Thos. J. Fay

Part II

TRUE, when the motor was running slow it was doing no work, and loss was 100 per cent. On the other hand, it is necessary to run the motor when the car is not running, and to whatever extent this necessity is indulged in it has a value in comparison with some other motor that refuses to run under the same conditions, on the same fuel economy; in some cases, then, the loss is more. The next best fuel economy was when the motor was running on full load, and as the nitrogen content shows the amount of air used was slightly more than when the motor was running slow. It is very likely that, under full load, a little more air was what was wanted, and the oxygen present, which was but 0.23, rather goes to show that the air was not up to the requirement.

Partly loaded, the losses were quite in excess of what should obtain, due to the lack of air, as shown by lack of oxygen excess, on the one hand, and to the low nitrogen content, on the other. In this case the oxygen excess was 0.3 and the nitrogen was down to 79.6, both of which showings go to indicate that the mixture was too rich. That this is a very important matter is plain to be seen, especially if account be taken of the hydrogen content, which was 2.4, when the motor was partly loaded, which hydrogen is worth about four times as much as carbon, as a fuel.

To some extent this question is complicated by the composition of automobile gasoline in that if the fuel does not burn, in the time allowed, because it is not volatile, sufficiently for the purpose, it is not a carbureter question unless it is found that, despite the inferior grade of the fuel, it will vaporize by preheating in the manner as shown in Fig. 2.

**The Principle of Testing Gasoline.**—While it is true that gasoline, in which several fractions of the hydrocarbon distillates can be tested by subjecting the same to a distilling process, and when the several fractions are separated, determine the value of them respectively, this process is a long one, and it cannot be conducted excepting with suitable equipment and by men of some skill. If the object is merely to determine if the sample, in any given case, is as good as it ought to be, considering some standard in hand, the best way to get at the facts will be to note the relative volatility of the standard and the sample to be tested. Fig. 4 will serve to convey the idea, in which it is shown that  $C_4H_{10}$  (gasoline) is placed on one pan of a suitable set of balances and some of the sample to be tested is placed on the other pan of the balance. If the gasoline evaporates the fastest, the beam will tilt in the downward direction on the side holding the sample to be tested. By plotting a curve to fixed intervals of time it would be possible to approximate the contents of the sample, as it relates to standards of known performance. In a suitably devised weighing machine the several fractions of gasoline will evaporate off in the order as follows:

## PROPERTIES OF AUTOMOBILE GASOLINE.

Name.	Formula.	Density.	Volatility.	Calorific.
Butane .....	$C_4H_{10}$	0.600	1	
Pentane, iso. ....	$C_5H_{12}$	0.628	31	
Pentane, normal ..	$C_5H_{12}$	0.626	36	
Hexane .....	$C_6H_{14}$	0.674	68.5	7,155
Hexahydrobenzine ..	$C_6H_{12}$	0.760	69	
Hexahydrotoulene ..	$C_7H_{12}$	0.772	97	
Heptane .....	$C_7H_{16}$	0.688	98	7,380
Octane .....	$C_8H_{18}$	0.719	120	7,560
Octane, normal .....	$C_8H_{18}$	0.707	125	
Nonane, a .....	$C_9H_{20}$	0.740	136	7,900
Nonane, normal .....	$C_9H_{20}$	0.722	150	
Decane .....	$C_{10}H_{22}$	0.738	160	8,060
Benzine .....	$C_6H_6$	0.884	80.4	9,690
Teulene .....	$C_7H_8$	0.871	111	

If the evaporation is noted and the difference in weight is observed at fixed intervals of time, the curve will show the several rates of evaporation and it will be possible to approximate the percentages of the more volatile fractions in comparisons with the heavier contents. Butane, for illustration, would disappear so rapidly as to make its measurement difficult. This fraction boils off violently at the normal temperature of the surrounding, and pentane boils "on a cake of ice." Hexane, on the other hand, boils at what may be regarded as the temperature of the surrounding, and it is therefore the natural fuel for use in automobile motors, particularly since the calorific value of this fraction is but slightly below that of the heavier fractions. The illustration, Fig. 4, is offered merely as a suggestion, with the idea of elucidating the principle, taking into account relative evaporation under normal conditions. The question of the "heat exchange" will be taken up also, especially since this is a phase of the situation that bears heavily upon the subject.

Considering fuel of this sort, in carbureters, in the conventional way, it is true that water-jacketing will go a long way toward vaporizing the gasoline, and even preheating the air en route to the carbureter will avail much. On the other hand, if the fuel is of the most non-volatile sort, as it may be, it is then that the gasoline will enter the cylinders in globule form, to some extent, at any rate, as depicted in Fig. 5, in which the globules are shown enlarged as they emerge from the carbureter, and since evaporation goes on all the time, and at a rapid rate, if the heat is there to excite the same, the globules will diminish in size as they traverse the manifold, so that the more heat there is available and the longer the manifold the greater is the chance of realizing the much-desired vaporized condition of the fuel by the time it enters the cylinders.

On the other hand, the amount of heat utilized for the purpose should be minimized, on the ground that the weight of fuel in acceptable form will be decreased if the heat is in excess of the exact requirement. That the power realized from a motor will be a maximum if the gasoline is in the most acceptable form is too plain to require further discussion, but there are other phases of the subject that can well monopolize space.

**Influence of Fuel on Cranking the Motor.**—In kerosene and alcohol motors the question of starting is probably the most important detail, and the greatest bar to the use of both of these classes of fuel. In automobile motors, considering "automobile gasoline," which is not nearly so volatile as real gasoline, this same question comes up, and it is becoming more important as the grade of gasoline is decreasing, from the point of view of volatility. With perfected motors, as they are now to be had, cranking would be with almost no trouble at all were gasoline

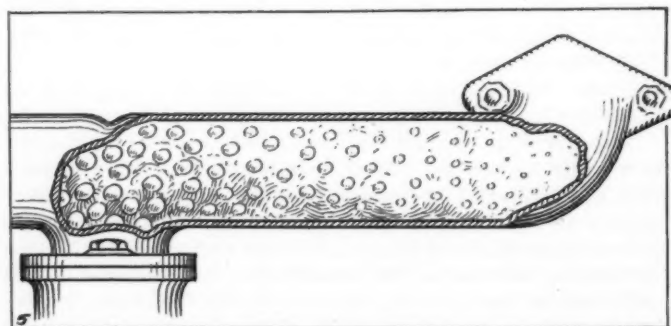


Fig. 5—Depicting the reducing sizes of globules for increasing length of the manifold.



of some grade as "hexane." Even as it is, if a large percentage of the gasoline is of the more volatile fractions, the cranking question is devoid of much difficulty, provided a means is at hand for flooding the carbureter, in order to assure that enough of the more volatile fuel will spill out on the "pan" to satisfy the conditions. Fig. 6 is offered with a view to showing the manner in which "priming" affords relief from the ills of fuel; a large part of which is so non-volatile that it will not vaporize until it contacts with the heated cylinder walls.

The object in priming is to spill out so much fuel that enough of the more volatile fraction will be available to enable the motor to be started. Once the motor starts and the cylinder walls are heated, the less volatile fuel will burn in any case when it enters the cylinders, unless it is that a portion of the fuel breaks down and forms coke. Between the most volatile portions of the fuel (which are the superior fractions to use in cranking) and the heavy fractions there is, of course, a range of fuel that will vaporize in the intake before it enters the cylinder, once the motor is warmed up and the heat is communicated to the surrounding parts. The construction, Fig. 6, is intended to show the manner in which the gasoline raises in the depression chamber "pan" as the result of priming, although it will be understood that there are many ways of constructing carbureters to attain the desired results. In this case the gasoline raises in the depression chamber of the carbureter, and the more volatile portion is picked up by the cold air as it enters the air passage when the motor is being cranked, due to the displacement of the pistons in the motor cylinders and the resultant inrush of air in the intake of the carbureter.

When the motor starts, the float or equivalent device takes charge, and in a few minutes the level of the gasoline falls away to the normal, due to the controlling action of the float. If the gasoline is of a good quality there is danger of flooding, so called, due to the volatility of all the excess gasoline in the pan, and since there is vastly more than is required for the normal operation of the motor, if it is volatile the mixture will be enriched in excess of the requirement. This trouble is disappearing, due to the lack of volatility of automobile gasoline as compared with gasoline proper, and in modern carbureters it is the practice to adequately provide for starting: (a) by so designing the depression chamber that the partial vacuum formed will be a maximum, and (b) so contriving that the flooding process will be effective. As soon as the motor starts, the auxiliary air passage is adjusted to afford an adequate volume of air, in order that the mixture will be the most efficient for the purpose, and, as before stated, when the amount of gasoline is about 1.9 per cent. vapor to air, the best results will be realized. It is not difficult to attain the best result for the reason that the auxiliary air valve will afford a wide range of adjustments, and the motorist soon attains a degree of skill which enables him to judge of the requirements.

**Effect of Evaporation on Temperature.**—When gasoline evaporates the temperature of the liquid is lowered, and the amount of the change depends upon the proportion of the fractions in the fuel, due to the differences in this respect between them. The drop in temperature for the respective fractions will be as follows:

**EFFECT OF EVAPORATION ON TEMPERATURE OF REMAINING LIQUID.**

Hexane.	Heptane.	Octane.	Decane.
19	17.9	17.2	14.8

The drop in temperature as above given is in degrees centigrade, assuming that the exact right amount of air is intimately mixed with the fuel in the process of evaporation, and on the further assumption that the fuel is not allowed to change in temperature at the expense of some outside source of heat. On the other hand, to assure this performance it is necessary to consider that the air has to be at a certain temperature at the time of contact with the gasoline. The minimum temperature will be:

**MINIMUM TEMPERATURE OF THE AIR FOR A GIVEN TEMPERATURE CHANGE.**

Hexane.	Heptane.	Octane.	Decane.
1.3	21.5	36.2	56.8

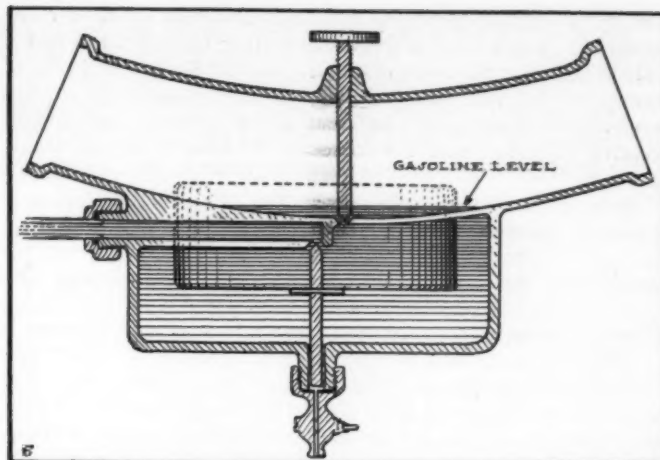


Fig. 6—Showing the accumulation of gasoline in the pan of the depression chamber, as the result of priming.

These values will depend upon the conditions as above set down, and in this case the temperature is in degrees centigrade also. There is one other point to be taken into account, *i. e.*: There is a minimum temperature at which a vapor can be supported, and this temperature will be different for each fraction, measured at the atmospheric pressure. This minimum temperature is given as follows:

**MINIMUM TEMPERATURE AT WHICH FUEL WILL VAPORIZE.**

Hexane.	Heptane.	Octane.	Decane.
—17.7	3.6	19.0	42.0

in which the temperature is in degrees centigrade. This tabulation is of the greatest importance, in that it indicates indirectly, to be sure, the relative vapor tensions of the several fractions of the hydrocarbons in common use in automobile gasoline. What will be the resultant of combinations of these fractions in practice is, of course, a speculation, and, too, account must be taken of the better performance of automobile gasoline when the air is in excess, rather than in the theoretical right amount.

In practice it is the custom to adjust the auxiliary air valve of the carbureter until the best result is realized, and it is common custom to consider that the air is in excess about 30 per cent. when the fuel is doing the best work. As to whether or not 30 per cent. is a good estimate must depend largely upon the motor in any given case, for, as has been demonstrated on many occasions, a carbureter that seems to do good work on one motor fails to work in a manner to be commended in another case, considering two motors of the same size. It does not follow that one of the motors will deliver more power than the other, although it might be possible, and it would be the height of good practice to look for more power from the motor using the least fuel under these conditions. It is certain that the thermal efficiency would be the highest for the motor that would work on a given (minimum fuel) carbureter adjustment, and in all probability the difference is to be found in the degrees of scavenging of the respective motors to a vast extent, at any rate.

Irrespective of the relative performance of motors it is necessary to supply an excess of air to all, the exact excess depending upon the quality of the motor in each case, and while the subject is up it is to say quality resides in a motor that uses fuel efficiently, and it is also true, very likely, that the motor requiring the least excess of air for a given fuel consumption is the superior motor to use. In the various types of motors available this excess air requirement is all the way from 20 to 60 per cent., with a few examples perhaps in which the excess air is below the low figure mentioned.

In view of the nitrogen content in mixtures, there is no actual need of any further dilution with a view to rendering the mixture slow burning. It will be understood that nitrogen serves a useful purpose, in that it renders the mixture sufficiently slow burning so that it can be used. Were the fuel free from nitrogen

and sufficiently supplied with oxygen in the right (excess) ratio, under the conditions of compression as they now obtain in motor cylinders, it is not believed that cast iron would hold together long enough to complete one revolution of the crankshaft after the event. The event would be what is commonly termed a disruptive explosion, and the force of the blow would do much damage.

With the minimum sufficient amount of air, considering a pound of gasoline, the products of combustion would be as follows:

**PRODUCTS OF GASOLINE COMBUSTION PER POUND OF GASOLINE.**

Carbon Dioxide.	Water Vapor.	Nitrogen.
2 pounds.	1.5 pounds.	11.8 pounds.

In this is evidence of the presence of 15.3 pounds of air per pound of gasoline, and, while the ratio will change under different conditions of fuel, the nitrogen content is the major portion. That this large volume or weight of nitrogen is necessary may be more or less true, but it is not necessary to include a considerable percentage of spent product of combustion in the bargain, hence the desire for the most perfect possible conditions of scavenging, or further additions of air in the absence of perfect scavenging. With imperfect scavenging more air is needed, for the reason that all the oxygen enmeshed in spent products of combustion is lost for the real purpose, and to whatever extent this process is represented additional air must be supplied.

Excess air in the mixture will upset the conditions involved in the temperatures, both of evaporation and of the air before evaporation. Increasing the air excess has the effect of decreasing the temperature drop, as would be natural, since the specific heat of the air is substantially constant, and the heat

units involved will be proportional to the weight of air taken, which, in this case, for 30 per cent. more air than the net requirement, will be as follows:

**EFFECT OF EVAPORATION ON TEMPERATURE OF REMAINING LIQUID.**

Hexane.	Heptane.	Octane.	Decane.
15.2	13.9	13.3	11.5

In this, as in the preceding case, it is assumed that the liquid is not affected by heat additions from any outside source, and the temperature in degrees centigrade is that due to the heat exchange, pure and simple. In this, as in the preceding case, it is also necessary to take into account the minimum temperature at which the air will have to exist, in view of the results given for the fall of temperature in the liquid on a basis of 30 per cent. excess air, which air temperature will be as follows:

**MINIMUM TEMPERATURE OF THE AIR FOR A GIVEN TEMPERATURE CHANGE.**

Hexane.	Pentane.	Octane.	Decane.
-7.1	13.2	27.8	49.2

Likewise, increasing the amount of air to excess over and above the net requirements for theoretical complete combustion influences the temperature at which the fuel can support vapor as follows:

**MINIMUM TEMPERATURE AT WHICH FUEL WILL VAPORIZE.**

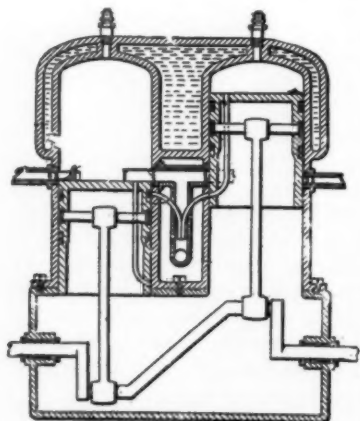
Hexane.	Pentane.	Octane.	Decane.
-22.4	.5	14.5	37.7

Increasing the air content has the effect of lowering the temperature at which the gasoline will vaporize, and, as will readily be understood, this is one of the reasons why excess of air is by way of decreased trouble in practical operation.

(To be continued.)

## HOW TWO-CYCLE EFFICIENCY IS INCREASED.

A new feature for application to two-cycle engines has been made the basis of letters patent by its inventor, Manuel S. Carmona, of Mexico City. One drawback of the two-cycle motor has been the poor efficiency of the exhaust stroke, this working out in two ways, one the exhaust gases left in the cylinder vitiate



Cross Section Carmona Motor.

part of the mixture, and the other, the incoming fuel is used to blow the exhaust out, some of it following, thus reducing the fuel economy. This new idea is applicable to any two-cylinder motor with cranks at 180 degrees or any four cylinder with adjacent cranks at 180 degrees. It consists primarily (as shown in the cut), of an extremely small diameter tube set into the piston in such a manner that at the point of maximum compression in that cylinder, its lower end will register with a similar sized

tube set into the cylinder wall and communicating with the pipe into which the adjacent cylinder is exhausting.

The idea of this is that a very small portion of the gases at compression pressure escaping into the exhaust pipe will create an injector effect or vacuum which will clear the cylinder of spent gases more quickly than otherwise.

## GEORGIA CITIES USING TAXICABS.

SAVANNAH, GA., April 19.—The hackmen in the State of Georgia are becoming alarmed these days because most every city has, or is going to use, taxicabs in a very short time. The latest to fall in line is Macon.

## TAXICABS IN PLENTY FOR THE HOOSIERS.

INDIANAPOLIS, IND., April 12.—Although there are no cabs now operating in the city, within sixty days there will be three separate lines working, with some twenty or thirty cabs on the job.

John E. Morand, interested in the Frank Bird Transfer Company and the Indianapolis Transfer Company, has placed an order with the Coppock company for ten vehicles, which will be placed at the Union Station and in front of the principal hotels.

The first company to get into action will be Charles W. Sheetes & Son, for whom the Lambert company has practically completed four taxicabs. These will be delivered and in use by the first of May.

The Overland company is now manufacturing taxicabs, of which some ten of the first lot have been ordered and are eagerly awaited by a local company.

From all appearances, it will not be long before many of these cabs will be in service, and from the interest that is being displayed in them it seems as if Indianapolis will be a red hot taxicab town.

## MOTOR TRUCKS NOW BARRED FROM DOCKS.

NEW YORK CITY, April 19.—The work of years in gradually winning the various steamship lines over to a sane view of motor trucks has been upset in a minute by the action of the New York Fire Insurance Exchange, which recently notified the owners of all docks that if gasoline or steam trucks were allowed on the piers they would increase the insurance rates 50 cents per \$100. As this is a 50 per cent. increase, the dock owners at once prohibited all vehicles using gasoline, kerosene, benzine or naphtha from going on the piers. Following this drastic action the New York Automobile Trade Association, the Association of Licensed Automobile Manufacturers and the American Motor Car Manufacturers' Association announced their intention of fighting for a more liberal attitude, which will place the self-propelled vehicle on a par with horse-drawn trucks. Having worked for years to obtain this privilege, they do not propose to lose it without a struggle.



# Repair of Aluminum Castings by Oxy-Acetylene

By Henry Cave

PROBABLY the most radical development produced by the advent of the oxy-acetylene flame is the welding of aluminum. As most people are probably aware, all other metals are amenable to some form of brazing or soldering process. Cast iron could have been considered in the same class as aluminum until a few years ago, when discoveries were made resulting in it being possible to braze it more or less satisfactorily. Aluminum, however, defied all attempts to unite it in a manner which would in any way approximate the strength of the metal. Though



Badly Broken Case Prepared for the Welding.

it has for several years been possible to solder it, the results are not satisfactory where anything more than the stopping of a leak or other requirements as would not subject the joint to strain. Even for this purpose it requires considerable experience to get satisfactory results, and the permanency is always doubtful, owing to the possibility of electrolytic action. The reason of this difficulty is that metallic aluminum always contains a small amount of oxide, and therefore it is extremely difficult to coat the surface without having an intervening layer.

Even though a neutral flame (or the flame can even be adjusted to contain a surplus of carbon) is obtained with the oxy-acetylene torch, the molten surface of the aluminum being fused by this means has a coating of oxide which has to be broken up by puddling with a steel rod, allowing the metal to run together, thus producing a weld that is practically local recasting. It has often been attempted to remove the oxide chemically by means of a flux, but so far this has not been accomplished, though certain chemicals have been found that help considerably and add to the strength and smoothness of the weld.

It is interesting to note that, though the oxy-acetylene welding process originated in France, and is much more extensively used there than in this country, we are considerably ahead of them in the art of welding aluminum.

Though aluminum fuses at a comparatively low temperature (1,200° Fahr.), its high conductivity for heat, which has a ratio of 31.3 as compared with 11.9 for iron, makes it necessary to use more heat in welding than is required by metals having a much higher melting point. The heat being conducted away from the weld into the surrounding metal to such an extent that when the surface to be welded becomes molten the metal for a considerable distance around is close to the point of fusion and liable to collapse if great care is not exercised. This is often guarded against by placing what is practically a complete mold under the part to be welded. The first illustration above shows this in practice, the clamp being used to hold the mold.

It can be readily seen that one of the principal features of carrying out this work is the time taken, as the longer the flame takes to fuse the metal, the greater the amount of heat that is conducted into the surrounding parts; therefore, the hotter the flame, the less the time and the conduction of heat. This is the reason why it is necessary to use a flame of such a high temperature (6,300° Fahr.) as that produced by burning acetylene with oxygen to obtain satisfactory results on a metal of such a low point of fusion, as aluminum.

Another feature is helped by confining the heat to as small a space as possible by reducing the time for conduction, as this also reduces the expansion. The chance of the part cracking, due to the shrinkage of the metal in cooling is considerably reduced. The chance of cracking can be realized when it is known that the shrinkage of aluminum in cooling, from the point of fusion to atmospheric temperature, is three-sixteenths of an inch per foot. The modulus of elasticity of aluminum as given in textbooks is 11,500,000 lbs. per square inch. This is a theoretical figure that represents the weight per square inch that would be required to stretch a piece of the material to double its length, if the elasticity remained the same as it is up to the point where it actually ceases and commences to tear the metal apart.

Tensile tests of aluminum alloy, as used for automobile parts, generally show that the elastic limit and maximum strength practically coincide, the material not having any appreciable elongation, and this elongation is reduced to a vanishing point when the metal is heated to a few hundred degrees.

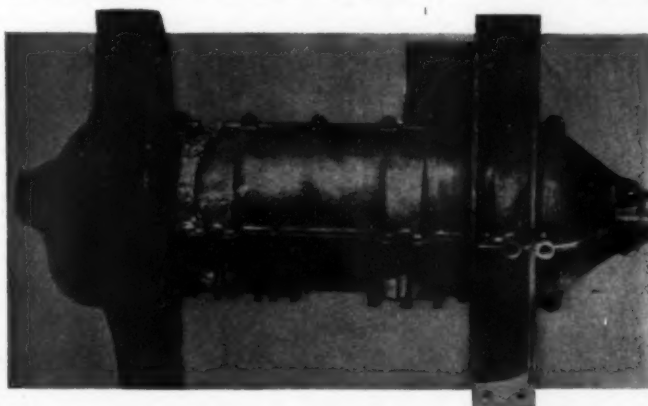
Taking an example of shrinkage in two inches, which is no uncommon length to have molten at one time, using the above

$$11,500,000$$

figures, then the stress produced would be  $\frac{11,500,000}{1/32 \times 2}$ , or 718,800

$$1/32 \times 2$$

lbs. per square inch, which is far more than any metal could withstand, and if it is not ductile enough to stretch, it would certainly pull part. This trouble is, however, eliminated in most cases by preheating the part to be welded, uniformly all over, and in this way reducing the extreme difference in temperature, and therefore the contraction between the metal at the weld and



This Case Was Nearly Severed, But Welding Saved It.

the rest of the casting. That is, the parts that otherwise would tend to hold the weld from contracting in cooling will themselves have to contract at the same time as the weld, thus practically eliminating the strain. It can readily be seen that it is not necessary to preheat the part when a foot or lug is broken off entirely, as there is nothing to restrict the contraction.

Castings having a thin part connected across parallel to a



Both Halves of Case on Which Fourteen Welds Were Made.

heavy section are practically impossible to weld with the present development of the process, though it is quite possible that means of doing this may be discovered any time. There is, of course, some difference in the action of the different alloys now being used, and what might prove a failure in one case might be a success with other material.

Up to the present time the new aluminum alloy, "Magnalium," which is coming into use, cannot be satisfactorily welded, due to a very heavy oxide forming on the surface, but a flux may sooner or later be discovered to eliminate this.

A few pictures showing work of this class are given on this page. They represent cases of entirely broken parts, those only cracked and instances where it was necessary to build up additional metal. Fig. 1 is a badly broken case prepared for welding with the mold and charcoal in place. Fig. 2 shows a lower half of a crankcase, which was nearly severed at one point. The third figure is a transmission case which necessitated welding in no less than fourteen places, as indicated by the small arrows. In the center of the figure, A shows where the metal was built up to form a new lug in place of one broken off and lost.

#### AMONG THE NEW AUTOMOBILE BOOKS.

**The Gas Engine.**—This 447-page work is an attempt to cover the whole of the field. The author, Forrest R. Jones, formerly an instructor at Cornell, and more recently at the head of the New York School of Automobile Engineers, has treated the subject in a manner that renders it more of a text-book than a reference work. The general order of the subject matter is as follows: Descriptive, operative, testing for faults, theoretical, results of tests. The very important subject of ignition is well covered, no less than 52 pages being devoted to it. The chapters on cooling, lubrication and exhausting are very brief, almost too much so. A short but very practical treatise on valve timing is followed by a number of pages on troubles and tests. A brief portion at the end of the book is given up to the pure theory of the heat cycles, which are well, if briefly, covered. The whole book is written in exceedingly plain language, the extremely technical being purposely avoided. This is a feature that will gain it many friends among the non-technical readers. The book is published by John Wiley & Sons, of New York City, and the retail price is \$4.

**"Automobiles."**—This is the text-book of the American School of Correspondence, located in Chicago, and consequently its 186 pages are rather elemental. The author, Hugo Deimer, M. E., is professor of mechanical engineering at Pennsylvania State College. The book is called a practical treatise on the construction, operation and care of gasoline, steam and electric motor cars, including mechanical details of running gear, power plant, body and accessories, instruction in driving, etc. The subject matter is divided into five chapters and copiously illustrated with cuts of American cars and parts of cars, very few line drawings being used. Considering its audience, the book has been carefully freed from any and all traces of theoretical or technical matter; in fact, it is of an intensely practical nature.

## THE AUTOMOBILE CALENDAR. AMERICAN.

### Races, Hill Climbs, Etc.

- April 22-24.....Chattanooga, Tenn., Hill Climb on Lookout Mountain, Lookout Mountain Automobile Club.
- April 23-25.....Denver, Col., Dealers' Demonstrating Tour, to Pueblo and return.
- April 24.....Philadelphia, Roadability Run to Atlantic City, Quaker City Motor Club.
- April 26-May 1...New York City, Second Annual Automobile Carnival, New York Automobile Trade Association.
- April 26.....New York City, Second Annual Hill Climb, Fort George-New York Automobile Trade Association.
- April 26-28.....Lawrence, Kan., Three-Day Endurance Run, Lawrence Automobile Club, Beatrice, Lincoln, Fairbury, Lawrence.
- April 28-30.....Pittsburg, Pa., Gazette Times-Chronicle Telegraph Three-Day Endurance Run. Indorsed by Automobile Dealers' Association.
- April 30.....New York City, Endurance Run, New York Automobile Trade Association.
- May 3-6.....Harrisburg, Pa., Third Annual Endurance Run, 700 miles, Washington, Baltimore, Scranton, Motor Club of Harrisburg.
- May 10-13.....Detroit, Mich., Four-Day Endurance Run, Detroit Automobile Dealers' Association.
- May 18-19.....Norristown, Pa., Second Annual Endurance Run, Norristown Automobile Club, to Hagerstown, Md.
- May 22.....Hartford, Conn., 200-Mile Endurance Run, Hartford Automobile Club.
- May 22.....Newark, N. J., Third Annual Endurance Contest, New Jersey Automobile and Motor Club, 190 Miles.
- May 31.....Wilkes-Barre, Pa., Annual Hill Climb, Glants' Despair Mountain, Wilkes-Barre Automobile Club.
- May 31.....Bridgeport, Conn., Annual Hill Climb, Sport Hill, Automobile Club of Bridgeport.
- June 1.....New York City, Start of Transcontinental Contest to Seattle, for Alaska-Yukon-Pacific Exposition, M. Robt. Guggenheim Trophy.
- June 12-14.....New York City, Catskill-Berkshire Endurance Contest, New York Automobile Trade Association.
- June 14-18.....Philadelphia Reliability Run to Pittsburg and Return, Quaker City Motor Club.
- June 17.....Readville, Mass., Track Race Meet, Bay State Automobile Association.
- June 18-19.....Chicago, Stock Chassis Race for Cobe Trophy and Light Car Race.
- June 21-26.....Binghamton, N. Y., Fourth Annual Endurance Run, Albany, Boston, Hartford, Newburgh, Binghamton Automobile Club.
- June 22-28.....Albany, N. Y., Fifth Annual Tour, Bretton Woods, Portsmouth, Boston, Albany Automobile Club.
- June 24-26.....Montreal, Blue Bonnets Track, Race Meet. R. M. Jaffray, Manager.
- June 25-26.....Philadelphia, 24-Hour Track Race, Quaker City Motor Club.
- July 3 and 5....Wildwood, N. J., Straightaway Races, Motor Club of Wildwood.
- July 4.....Los Angeles, Cal., Southern California Automobile Dealers' Association. Road Races, 250 Miles for Large Cars; 150 Miles for Light Cars.
- July 12.....Detroit, Start of Sixth Annual A. A. A. Tour for Glidden Trophy.
- Sept. 6-11.....Lowell, Mass., Automobile Carnival, Lowell Automobile Club.
- Sept. 15.....Denver, Col., Start of Flag to Flag Endurance Run to Mexico City.
- Oct. 7.....Philadelphia, Second Annual Stock Chassis, 200-Mile Race, Fairmount Park, Quaker City M. C.
- Dec. 29-30.....Philadelphia, Fourth Annual Mid-Winter Endurance Contest, Quaker City Motor Club.

## FOREIGN.

### Races, Hill Climbs, Etc.

- April 22-30.....France, Paris, Small Commercial Vehicle Competition.
- April 26-May 13..Germany, Commercial Vehicle Competition, Kaiserlicher Automobile Club.
- April 29.....Sicily, Volturette Races.
- May 2.....Sicily, Targa Florio, Automobile Club of Italy.
- May 6-9.....Austria, Small Vehicle Competition, Automobile Club of Austria.
- May 8-23.....Belgium, Antwerp, Sixth International Automobile, Cycle, Maritime and Fluvial Exposition.
- May 10-15.....Sweden, Industrial Vehicle Competition, Automobile Club of Sweden.



# Letters Interesting and Instructive

## NAPHTHALENE INTERESTING.

Editor THE AUTOMOBILE:

[1,843.]—Will you please inform me where naphthalene can be procured and at what price? How is it used as a car fuel and can it be used in common runabouts?

A SUBSCRIBER.

Griffin Corners, Delaware County, N. Y.

Naphthalene is put on the market in three forms: flake, balls and crystals. These may be obtained from any wholesale druggist. The retail price cannot be given, but it will not be far from 3 cents per pound, as the wholesale price is 2½ cents. This is for all grades, but the first and last would be the most pure and, therefore, by far the most desirable.

To use it as a car fuel will require special apparatus: first, to melt it; second, to heat and vaporize the resultant liquid, and third, means for feeding the vapor to the engine as required. Aside from melting it, the process of using it will be exactly similar to the use of alcohol as an automobile fuel. Gasoline weighs a little over 6 pounds per gallon, so that at 18 cents per gallon the price per pound is about 3 cents. This gives a basis of comparison, but not very favorable to naphthalene. In France it costs 12½ cents per pound, while gasoline is 65 cents per gallon. This makes the latter cost about 10½ cents. Even at these apparently unfavorable prices, it appears that the motor uses less of the naphthalene fuel than of the gasoline. On the Paris-Versailles test, spoken of in the March 25 issue of THE AUTOMOBILE, the cost of fuel using gasoline only was \$2.75, while the other cost but \$0.82, with \$0.22 added for gasoline used in starting. Apparently more tests are desirable.

## AUTO RAILWAY CAR.

Editor THE AUTOMOBILE:

[1,844.]—I understand that there are some attachments made for use in running an automobile on railroad tracks. Will you kindly give me addresses of all the different makers of these attachments?

H. E. H.

Princeton, W. Va.

About the only attachments necessary for cars of standard gauge are a means of locking the steering gear and railway wheels with the proper flanges. If the car is not of standard gauge, some sort of shims or washers will be needed to bring the gauge (tread of the automobile) up to or down to standard railway gauge. As to flanged wheels, you being a railway man, should know of more manufacturers than we do. Simply order them with plain hubs and bore the hubs out to suit your axles. We have never heard of a manufacturer of a steering gear lock for this purpose, but you can render the gear ineffective by taking off the cross connection back of the axle and the steering rod from the right knuckle to the moving arm of the gear.

It is not advisable to use an automobile in this manner, as it throws upon the springs and other running gear parts undue strains which they were never designed nor intended for. Ball bearings in the wheels, for instance, would not stand up very long under the pounding of uneven rail ends, nor would any hardened bearings.

## INCREASING THE COMPRESSION.

Editor THE AUTOMOBILE:

[1,845.]—In case it is desirable to increase the compression in a cylinder, is it practicable to do so without recasting the whole cylinder? I refer to two cycle engines where it would be impossible to use plates on top of the piston. If you will give me the details of the best method to accomplish this result, I would appreciate it.

New York City.

INCREASE.

There are four ways in which the compression of a two-cycle engine can be changed, and there seems to be some drawback to the use of nearly all of them. In case your engine has a separate cylinder head, held on by bolts, the upper part of the combustion chamber of this can be "fattened up" with some form of plate or any other means which will decrease the size of the chamber. In case your cylinders are not so made, this process will not be an easy one.

Then the second method could be tried. In case the cylinder casting is bolted to the crankcase, take the cylinder to a machine shop and have an ⅛ inch or the desired amount turned off of the lower face.

In place of this you can get a new connecting rod with the hole for the piston pin raised above the height of the present one by the desired ⅛ inch, that is, get a rod ⅛ inch longer.

The last resort will be a new piston with the hole for the piston pin bored lower than standard by the amount desired.

The only drawback to the first method is the work connected with it, particularly to do a nice job. In the case of the last three, however, the changes all alter the action of the piston in uncovering the ports in the cylinder walls, and with it the action of the cycle. That is, the piston would not uncover the inlet and exhaust ports at the same time in the stroke as at present, and possibly might not uncover them at all. This alteration of the cycle would probably eliminate some, if not all, of the power of the engine, and in any case would alter it greatly.

Summing up the advantages and disadvantages, unless your engine is so constructed as to allow of readily decreasing the combustion chamber volume as per the first method, it would not be advisable to try to change it. In any case, confer with the manufacturer before going ahead.

## PROPER VALVE TIMING.

Editor THE AUTOMOBILE:

[1,846.]—Will you please give me some idea of the proper valve timing? My engine does not run very well and I am thinking of changing the valve setting.

R. B. JOY.

Buffalo, N. Y.

In an article in THE AUTOMOBILE, October 29, 1908, the subject of valve timing was exhaustively treated. In that article figures were given for a number of prominent French engines. The average valve timing for the 31 engines was as follows: Inlet opens 8° 6' past the upper center, inlet closes 26° 15' past the lower center, exhaust opens 46° 20' before the lower dead center and closes 5° 40' beyond the upper center.

You do not mention what your trouble is or we might be able to offer some advice. In any case it is not advisable to tinker with as important a matter as this without first consulting the manufacturer. It is barely possible that your camshaft has been put in place one tooth out of the correct position. This would effect the whole cycle very materially, so it would be advisable to look at the gears and see if they are not marked at the point of correct meshing.

## FLAT VALVES AND SPEED.

Editor THE AUTOMOBILE:

[1,847.]—Will you please answer the following questions in your "Letters" columns:

(1) When and by whom were the following originated: transmission on the rear axle, underslung frame, valves in the head.

(2) What American cars use flat seated valves.

(3) Did an eight-cylinder motor cycle ever do 120 miles per hour as has been claimed?

St. Paul, Minn.

L. G.

It would be a hard matter to give an exact answer to all of your questions, thus it is impossible to say who was the originator of all automobile parts. De Dion was one of the very early users of transmission placed on the rear axle, this being in 1899. Valves in the head were first used by Diesel. We do not know who first used the underslung frame.

(2) Locomobile uses flat-seated valves for the inlet on the 40-horsepower car. Hewitt also uses them on his trucks. The manufacturers of the Jencick motors, employed mostly in motor boats, use flat seats. These are about all of the American cars using them. This type is more favored on the other side, as in England, James & Browne, Humber, Brush, Wilson-Pilcher, and some of the Napier output are so equipped. Fiat is a prominent advocate of this construction.

(3) We have never heard of this claim nor of any speed trials or races which would substantiate it. In "The Automobile" for February 25, 1909, you will find the following, relative to motor cycle time: "The fastest time recorded as having been

made on a motor cycle is that of a mile in 44  $\frac{2}{5}$  seconds, a speed of 81.08 miles per hour, by William Wray on an imported Peugeot machine. This is not recognized by the F. A. M. as a record, because the engine was rated at 14 horsepower. The record for a straightaway is 46  $\frac{2}{5}$  seconds, a speed of 77.58 miles per hour, made by G. H. Curtiss, on a Curtiss. The circular track record is 54 seconds, a speed of 66.66 miles per hour, held by Fred Huyck, riding an Indian." As a speed of 120 miles per hour would mean a single mile in 30 seconds, you can see thus far it has not even been closely approached.

### WANTS TO DYE.

Editor THE AUTOMOBILE:

[1,848.]—Will you please tell me what to use to color a canvas top black, something that will not fade and will stand weather conditions. S. L. D.

High Point, N. C.

The best substance to use is boiled oil, which you can obtain anywhere. This is applied with a brush or in any handy manner. To color this, add the color pigment until the desired shade is obtained, stirring the mixture very thoroughly. Apply this to the top in a series of coats, the first of pure oil only, the others of pure oil or the colored mixture, as desired. These should bear some relation to the number of coats which you wish to put on. Any number may be used, but beyond four the total coating becomes rather thick and therefore more liable to crack. Up to four, however, you are safe, and this number will shed water perfectly. With four coats, only the last needs to be colored, that is three coats of oil and a final coat of colored oil. If you have no fear of cracking, you can use as many coats as you desire to, the waterproofing effect increasing with the increase in the number of coats.

### PECULIAR MISFIRING.

Editor THE AUTOMOBILE:

[1,849.]—Will you please explain to me the cause of my engine missing? It is a four-cylinder machine of a popular make and not over two years old. The valves have all been ground in very recently and the seats are O. K., the plugs have been carefully examined and are also all right, the cylinders all fire and apparently fire in proper order and at the proper time. Yet in spite of all this the engine misses, particularly at high speeds. On low speeds and at starting it runs fine as well as anyone should ask, but as soon as I speed up it begins to miss.

Rochester, N. Y.

X. Y. Z.

Your trouble is apparently in a sticking valve stem or stems. Take out the valves one at a time, and see if the stems have become gummed with oil. In fact, if this is the only trouble, it will not be necessary to take them out, but just squirt kerosene on the stems. In case it is not a matter of gumming, you will have to ascertain if the stems are straight. You can do this by rolling the stem portion on a surface plate, when any deviation from a straight and true shape will show itself. The valve stem may be out of round, which the rolling process will also disclose. Having correct-

ed these sources of trouble, if the engine does not run as it should, look to the valve guides in the cylinder. They must not only be clean, straight and round, but at right angles to the plane of the seat.

The trouble of missing with correct ignition and tight valves is made apparent in the missing at high speeds. If the valve sticks, a sufficient charge will be drawn in, but the valve will not close, due to some of the causes we have mentioned, and the compression stroke will blow the charge out again. At slow speeds, the valve spring has a measurable time in which to act, so the effect is less, but as the motor speeds up this time becomes less and less, so the final result is that the whole charge is blown out or such a large proportion of it that there is not enough left to ignite. As a result, the engine misses, and will continue to miss until the valve stems have been properly attended to.

### WANTS TO MAKE GASOLINE.

Editor THE AUTOMOBILE:

[1,850.]—Will you please tell me what apparatus is necessary and what will be the process for making gasoline from natural gas? Would such a process be liable to be commercially successful? H. Mcgregor.

Harper's Ferry, W. Va.

Going into the chemistry of the matter, we find that natural gas, like many of our other fuels, is a compound, the principal constituents being hydrocarbons. These are themselves compounds, and are grouped broadly into two classes, the paraffins and the olefines. If a heavy hydrocarbon of the paraffin series be exposed to heat while under pressure it will be decomposed into a lower hydrocarbon and an olefine.

For instance  $C_{12}H_{26}$  is decomposed into hexane  $C_6H_{14}$  and the olefine, hexylene,  $C_6H_{12}$ . In a similar manner, the reaction may be continued until the highest member of the series and the most desirable from a fuel standpoint, methane,  $CH_4$ , is obtained. The normal composition of natural gas is such that 93 per cent. of it is hydrocarbon. Gasoline being a hydrocarbon it

is possible by means of heat and pressure suitably applied to produce it as the ultimate result. It is possible, but not very probable, and the whole matter should be looked upon rather in the light of a laboratory "stunt" than of any practical value.

The same line of reasoning has been applied to the production of alcohol from natural gas, this being given the preference over gasoline, for the reason that the present market price of alcohol is about twice that of gasoline, and thus there is a chance of the process being commercially successful.

### MORE ABOUT TOWING CONTESTS.

Editor THE AUTOMOBILE:

[1,851.]—In the April 1 issue of "The Automobile," in Letters Interesting and Instructive, H. M. Conroy asks: "Wherein would the motor be tested, in a coasting contest with the clutch disengaged." It would not, and that is one of the things to be desired. Many a good motor is badly abused by having to propel a lot of junk. Most every rig has one or more places where power is being wasted, and the motor gets the blame. A dragging brake band causes overheating. Does the user fix the band? No! He gets a larger pump or gears the fan faster or puts on more radiator. He does not know any better. The coasting or towing contest would tell him better. It is true that there are tricks to all contests and that a contest proves little or nothing. But there is just as much trickery about a contest up hill as there can be about one down hill. If the honor of the contestants cannot be trusted (I believe it usually can be) then appoint investigating committees who will see that the rigs are in operative condition. Or put the winning rigs through a road test immediately after winning.

I have for years believed that every owner should know about how much it takes to move his rig on the garage floor. Either he should have a spring balance handy and tow it or he should push it often enough to know when it is pushing freely, and when there is something wrong that needs looking into.

I send photo showing a Buggyaut being towed. I have rigged on this a large scale so that the actual pull can be easily photographed. A cycle air tube forms the spring. A standard spring scale is also used to be certain the results are correct. Such a large scale could be easily used in a towing contest, and the public could see the actual pull for themselves. An asphalt street, and no wind, is all that is needed. These tests ought to be very common. They would add a lot to the improvement of the auto.

Mr. C.'s suggestion that a flexible motor is much to be desired is certainly correct. This can be gotten at by taking the slowest high speed on a hill and the fastest high speed time of the same rig.

Reading, Pa. CHARLES E. DURYEA.



Duryea Car Rigged with a Spring Balance to Measure the Pull Required to Move It.



## CONCERNING AIR-COOLING AS OPPOSED TO WATER-COOLING

By ARTHUR HOLMES, FIRST ASSISTANT ENGINEER H. H. FRANKLIN MFG. CO.

IN THE AUTOMOBILE, March 18, appeared "Automobile Cooling Systems Analyzed," by Morris A. Hall, relative to the comparative efficiencies of air-cooled and water-cooled automobile motors. In this occurred several statements, evidently made without sufficient reflection.

After giving the reasons for cooling the cylinder walls of an internal-combustion motor—which, by the way, are undoubtedly correct—he quotes from the Franklin catalog relative to the cylinder wall temperature at which a gasoline motor does its best work. He then goes on to say that this temperature is entirely too high because, although he admits the thermal efficiency at such a temperature is indeed very high, the mechanical efficiency would be lowered correspondingly so that the net result or B.H.P. would remain the same.

Mr. Hall right here lays himself open to very serious criticism, for he forgets that it is the practically universal custom to compare the performances of gasoline engines by B.H.P. This, of course, takes into account the mechanical efficiency. For instance, suppose we had two engines of identically the same bore and stroke, the general design of bearings, etc., the same, one of these engines, however, being water-cooled and the other air-cooled. Suppose, then, these two engines were put on the block and tests for economy were run off. Inasmuch as it is impossible at the present date to accurately indicate the horsepower of a high-speed gas engine, it would be necessary to base these economy tests on the B.H.P. delivered by each motor.

Mr. Hall in his article makes use of a heat balance taken from a well-known authority (we think we have seen it in Dugald Clerk's book, "The Gas and Oil Engine"), in which the I.H.P. is given as 17 per cent. of the total heat units contained in the fuel. This is undoubtedly a very good example of what a water-cooled motor should do, and from the present writer's experience the B.H.P. seldom attains this figure.

We are safe, then, in assuming that the water-cooled motor which we are testing would do no better. On the other hand, however, the air-cooled motor would develop its power with an efficiency, calculated in the same way, of 19½ per cent. This can be verified by the authorities at Sibley College, Cornell University, under whose direction many such tests have been run off on a Franklin motor in the laboratory of that institution. This would mean that if these motors of the same horsepower were put into two identical cars and run over identically the same roads in the same way, the water-cooled car would use 14.1 per cent. more gasoline than the air-cooled car. Of course, it would be impossible to put these two engines in exactly the same cars, for Mr. Hall says "the more bulky, assuredly heavier, and admittedly more complicated fluid systems with positive circulation."

We have proved to ourselves and others, by such tests, that air-cooling does raise the heat efficiency based on the B.H.P., regardless of whether this rise is due to a great rise in thermal efficiency proper, accompanied by a smaller loss in mechanical efficiency, or by not quite so great a rise in thermal efficiency and no change in mechanical efficiency.

The mechanical efficiency is, of course, the ratio of the power delivered by and outside of the engine to the power developed inside the cylinders. This term is made necessary because of the fact that some of the power developed inside the cylinder is lost as far as useful work is concerned, in friction, due to the pistons working in the cylinders, the connecting rod and crankshaft bearings, the camshaft gearing, etc. In fact, wherever any mechanical motion occurs power is lost, due to friction. It is with this loss in friction in the engine parts which we have now to do. As Mr. Hall says, one of the chief reasons for cooling cylinder walls is to insure proper lubrication; he might very well have said, then, as far as lubrication is concerned it is unnecessary to cool the cylinders as long as they are perfectly lubricated. In other words, cooling, from a lubrication point of

view, is merely a relative term depending entirely upon the nature of the lubricant.

We have no tests at hand showing the friction losses in motors running perfectly cool and others running at the temperatures attained by air-cooled motors, nor do we know any; but we do know that in general the friction generated between two surfaces is dependent upon their lubrication, and not upon temperature.

Quoting from Unwin, an efficient lubricant should possess the following qualities:

- (a) It should wet the rubbing surfaces.
- (b) It must not evaporate or decompose while in use.
- (c) At the temperature at which it is employed it should have enough, and only enough, viscosity to remain between the surfaces.
- (d) It must contain no acids or other constituents capable of acting on the rubbing surfaces.
- (e) It must be free from grit or other foreign matter.

From the above it can readily be seen that the only qualification having any bearing on the case in question is that the lubricant should be correct for the temperature at which it is used. Now there are many lubricants which can stand a temperature of 350°, so the lubrication question is very easily solved. In fact, it is far easier than in many cases in so-called ordinary steam engineering which may have escaped Mr. Hall's attention. We refer now to engines using superheated steam or even high-pressure steam, in which case the cylinders are often jacketed by steam at a pressure of 200 pounds or so. In this latter case this means a temperature of approximately 375°.

Quoting Unwin, again: "With ordinary superheated steam, superheated about 100° or 150° F., the only care necessary is to use an oil which stands a high temperature, and various universal oils, some of them distilled or charcoal filtered, are available. The flash points of such oils are from 500° to 700° F." It would seem from this that long years ago the question of high temperatures in cylinder walls had received a great deal of attention, and that it had not scared engineers to any great extent. At any rate, we still hear of superheat and high-pressure steam and we also hear very little or nothing about loss of mechanical efficiency due to using high-pressure or superheated steam.

In his article Mr. Hall makes the statement that a tight, or even close-fitting, piston cannot be used in an air-cooled engine. If he means by this that when the cylinder and piston are cold the piston diameter is less than the bore of the cylinder by several thousandths more than would be the case with a water-cooled engine, he is probably correct. Mr. Hall goes on to say that "from this it is at once apparent that the mechanical efficiency is very low indeed." This is the first time we have ever seen a tight piston advocated over a loose one for the purpose of increasing mechanical efficiency. But he should remember, of course, that nobody knows exactly what clearance there is between piston and cylinder when the motor is warmed up to its working point. He should remember also that this clearance is the important one. Now what indicates that the lower limit of clearance has been reached is that the piston will seize or stick to the cylinder walls when the motor reaches its working temperature, even when the motor is flooded with oil. On the other hand, generally speaking, the fact that the upper limit has been reached will manifest itself in a slap or knock. It will be admitted by most engineers that the proper clearance is the least which will allow the piston to work freely in the cylinder under the hottest working condition. The reason for keeping this clearance as small as possible is to prevent, for some time at least, the ill effects due to the inevitable wear which will eventually occur.

Now, then, what is the obvious and scientific way of solving this problem? We solved it by taking a standard motor and equipping it first with a set of pistons which we felt sure, because of their great clearance, would slap. A hard road test showed that they did. These pistons were then removed and

larger ones by a couple of thousandths substituted and the same routine gone through. This process was continued until the slap disappeared. We then had found our upper limit of clearance. From here the process was continued, until finally the clearance became so small that there was a perceptible drag in the motor

and then seizure occurred. We had thus found the lower limit of clearance. Observations taken all during these tests gave indisputable evidence as to what was the best clearance to use, or, to be more exact, what was the proper size piston for that size cylinder. Could anything be simpler or more accurate?

## A. L. A. M. STANDARDIZATION ACCOMPLISHMENTS

### FROM COKER F. CLARKSON ON THE SUBJECT.

Editor THE AUTOMOBILE:

It is hard to account for the reply given to H. A. Morris, on page 583 of the April 8 issue, in answer to the inquiry as to what the Association of Licensed Automobile Manufacturers has done in the way of standardization of parts.

It is well known that during recent years the A. L. A. M. has annually compiled for its members new specifications for the various materials used in automobile parts, resulting in the use by its members of stronger and more elastic metals. The result of this is seen in what the association cars have done in ordinary touring service and in contests.

The engineers and master mechanics of the association members have been quick to draw their accurate and logical conclusion from the data on various engineering subjects, jointly and severally submitted and discussed at their periodical meetings during recent years. These men are as able and progressive as any body of men in the world, and any statement tending to belittle their work can only reflect on the man who makes it. The generously given and effective co-operative work of these men has probably never been surpassed. At any rate, it has been characterized by many well qualified to judge as unique and without parallel.

As to standardization, it must be remembered that, fundamentally, standards are not spontaneous products, but what is indicated as best in long practice, and it is reasonable to assume can be used by the average manufacturer, both in the line of suitability primarily and as related to best practice. The adoption and promulgation three years ago of the A. L. A. M. screw standard was an event which indicates as well as anything else the competency of the association engineers to take the responsibility of passing alone and unaided upon a broad engineering subject. There has been a demand for at least forty years for a fine pitch screw standard. The matter not only lay dormant but was becoming more complicated every day because various kinds of machinery subject in use to great vibration demanded a thread of relatively fine pitch compared to that laid down in the old United States standard, and various more or less used fine pitch screw threads sprang up. There was also a long-continued unsatisfied demand for a properly designed castle nut. Incidentally the progress of automobile construction required stronger and tougher material, allowing less weight and neater appearance of screw for a given piece of work.

The A. L. A. M. has been absolutely the protagonist of this standard. It issues the only official edition of it and has carried on the mass of consequent communications with people in various lines of business throughout the world as to the details of it—such as matters of master gages, source of supply of both raw and finished material, taps and dies, and the best practice in drill sizes, etc. This screw standard met a crying want and has been an unqualified success. The propriety of its increasingly occupying its field must be more and more recognized.

The statement that the A. L. A. M. standard spark plug shell is different from all previous sizes is absolutely wrong. The A. L. A. M. standard spark plug has been as successful as the screw standard. Primarily it is what has been for some years known in the trade—since the start of the industry practically—as the Autocar plug.

Standardization is a word which carries a note of joy to the heart of every mechanic and every engineer; has been a long-cherished dream of the motoring fraternity; expounded as a doctrine; taught as a theory; discussed as a possibility, and advertised as an accomplishment ever since the automobile industry began to take shape as such. It is obvious that in this sense standardization may be a hobby. It is equally obvious that the A. L. A. M. engineers deserve credit for what they have had the sense not to standardize, as well as for the positive creative standards brought about.

It is easy to say, and it has been said for years, that control should be standardized, but it is not easy and it has not yet been considered feasible to do so, owing to the viewpoint of the different manufacturers as each in his light sees the demands of the public. To-day some people believe that for the high gear the change speed lever should be in one position; others are confident that it should be in another. Such features of construction as spark and throttle levers, axles and wheels, must of necessity be boiled down by time to the best practice. They are purely matters of design and preference, and distinct from the subject matter of a standard dealing

with ratios or measurements after one design or form of a part has been practically universally accepted.

The function of standardization is in reducing the cost of and facilitating production, which is made possible by the fact that standardized parts, or tools with which they are made, are kept in stock at low prices relatively; and in the less cost and time involved in the replacement of parts by repairmen and users.

ASS'N OF LICENSED AUTOMOBILE MFRS.,

New York City.

COKER F. CLARKSON.

### E. T. BIRDSALL ON STANDARDIZING.

Editor THE AUTOMOBILE:

I desire to take issue with you on the answer to letter No. 1,820, April 8. In that answer it is stated that the mechanical branch of the A. L. A. M. has only made a small start towards standardization of automobile parts. If all the screws, bolts, nuts, yoke and rod ends, levers, spark plugs, and Q. D. rims on a car constitute a small part, then my idea of proportion and that of your writer's are far apart.

The yoke and rod ends were not standardized for the purpose of getting lower prices on forgings, but to get parts that were correctly designed for their work, and of such sizes as were needed in automobile construction. If I remember rightly, the price of these improved forgings is slightly higher than the old ones. They are designed with correct proportions as to bearing surfaces, wearing surfaces and range of adjustment, and are the result of months of work on the part of most of the best designers in the country, as well as parts manufacturers. The new standard screw threads which your writer passes over so airily were necessary, as there was no standard that was consistent or suited to the requirements. The new standard is the result of many conferences between the automobile engineers and such firms as Brown & Sharpe, Pratt & Whitney and several large screw and tap and die-making firms. That the standard is good, is right, and is used by one of the best car-building concerns would seem to refute the printed statement that "this is really a complication."

The standard spark plug did not create any trouble that the writer is aware of, as he has had no difficulty in getting them from any maker of plugs. It did not differ from all others, as the Autocar Company has been using this size of plug and pitch of thread for the entire term of its existence. If it is not good, what other size is better? What other size is standard? Who else has done anything to establish a standard? The other association and the S. A. E. have not been heard from.

After over two years' work in reconciling the various trade interests involved and many costly experiments, a standard Q. D. rim was adopted which will be much in evidence in 1910, as the rolls and other tools could not be made ready for the 1909 cars. A very complete set of levers has been designed by the engineers of the mechanical branch with the help and advice of the principal makers of drop forgings. These will also be out in 1910.

If you think it is an easy matter to standardize wheels and axles, just write to all the makers and see what they think of it. One hundred answers will produce one hundred designs that one hundred designers know to be the only design fit to be used under a car. The same applies to frames, springs, control parts, size of seats, etc., ad infinitum. Where is the standard carburetor? It will arrive on the same train as the standard axles and wheels, et al.

When all men look alike and act alike, then all cars will have the same method of control and not before. The mechanical branch attempted to standardize some other parts, but the difficulties to be surmounted and the conflicting opinions of what was right or wrong were so diverse that the task was abandoned as hopeless, at least for the present. The engine rating formula which you approve the branch considers as its poorest work, as it is admittedly an arbitrary makeshift.

At the time, the standardization of the bolts and nuts seemed like a "real big problem," but I see now that we are making a mountain out of a mole hill and should have started on something "real big" like the body or the engine. I am no longer connected in any way with the A. L. A. M., but like to see credit given for useful and conscientious work.

New York City.

E. T. BIRDSALL, M.E.



# Auto-Making Within a Hundred Miles of Philadelphia

W. M. Kline White

PHILADELPHIA, April 19.—Southeastern Pennsylvania, famous as the location of many great industries, is now one of the busiest automobile manufacturing sections of the country. Within a radius of 100 miles of Philadelphia there are seven concerns of note working up to capacity to produce cars to supply orders received from all over the country. The estimated aggregate output of these concerns will be between 3,500 and 4,000 automobiles, and the hum of the machine shops and the erecting departments is indicative of the prosperous conditions generally throughout the automobile making and selling world.

Night and day work has been found necessary in some instances to keep the output approximately at the point of the demand. All types of cars are being constructed, from two to six cylinders, both for pleasure and for business purposes, and in addition to those companies confining their attention to the building of automobiles, there are numerous factories with products allied to those of the automobile, which have shared generously in the general improvement of business.

The York Motor Car Company and the Hart-Kraft Motor Company, at York; the Autocar Company, at Ardmore; the Chadwick Engineering Works, at Pottstown; the Acme Motor Car Company and the Middleby Auto Company, at Reading; and the Pennsylvania Auto Motor Works, at Bryn Mawr, are the ones which contribute to the welfare of the industry at large from the southeastern part of the Keystone State.

An important situation in Pennsylvania in connection with the building of cars which has given the manufacturers much satisfaction is the urgent demand for automobiles among farmers of that wealthy agricultural section of the State. It is no longer a strange sight to see a family of quaint-clad Mennonites, Dunkards or Amish going to church or to town in a high-priced touring car.

With the 1909 output generally allotted, and under way through the factories, several of the Pennsylvania firms are actively laying plans for the 1910 season. One firm hopes to have its entire 1909 product completed by the middle of July, another by the middle of August, still another will have two new models for sale within the present month, while a fourth is making no plans for changing its present style and will continue to build the same cars throughout fall and winter.

## THE PULLMANS PRODUCED IN YORK.

YORK, Pa., April 19.—Working 22 1-2 hours of the 24, the York Motor Car Company, under the immediate direction of James A. Kline, general manager, is intent on the production of between 550 and 600 automobiles for the 1909 season. With nearly five hundred employees, an enlarged factory, new machine tools and

everything favorable to securing maximum productive conditions, the firm is still behind its orders, and is at present endeavoring to overhaul the demand with an immediate supply. There are four sizes of Pullman chassis built, and these are equipped with seven types of open bodies. Only one model now can be delivered as soon as ordered, and that is the smallest one, a car of 20-horsepower. Mr. Kline, in going through the big plant, speaking of the circumstances which have required the use of the factory by night as well as day, said:

"We have greatly enlarged the plant through the addition of new buildings and the renovation of ones which were formerly occupied by the carriage works, so that we now have over 90,000 square feet of floor space. Our machine shops have been given increased facilities through the purchasing of new tools and we absolutely manufacture every part of the Pullman car, buying only the engines, aluminum and other castings and forgings, and the frames. Bodies, wheels, gears, nuts, bolts, shafts and the thousand parts that are necessary to make up a high-grade car are machined right in our own shops and nothing is bought assembled. At present we are shipping from 16 to 18 cars each week, from 45 to 50 a month being the average, so that with those already sent away, our production will total 550 or 600.

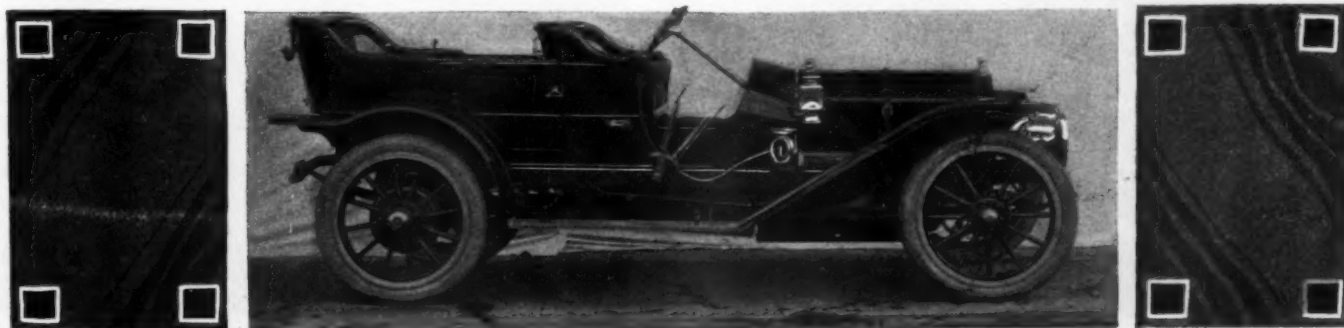
"We hope to be through with the 1909 material by the middle of July, and perhaps a little earlier, so that we can start in on cars for the following year. In fact, we expect to start on 1910 work within two weeks, and will begin to take orders for September delivery. I can assure you that there will be very little change, but there will be some few details which will be altered.

"As to contests, it is pretty hard to say just what we will do for we have been too busy to consider the matter very thoroughly. We will enter two cars in the annual endurance run of the Motor Club of Harrisburg, and I presume that we will have Pullmans in more or less track racing."

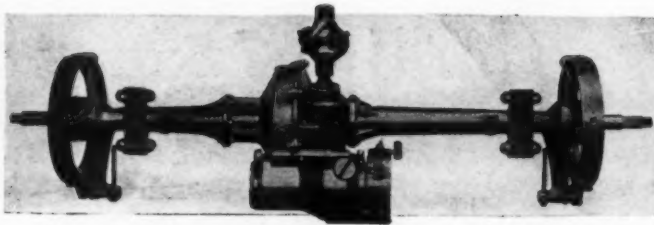
Of the four models, the medium-priced touring car with the 30-horsepower engine has proven the most popular of the line, and already 202 of the 300 to be built have been shipped. Of the 150 small cars of 20 horsepower, 70 have been sent away and on this model alone can immediate deliveries be made. About 50 four-cylinder cars of 40 horsepower will constitute the output of that size, and 36 of them are in use, while there are still 44 of the 50 six-cylinder cars to be built. Thus of the entire 550 planned in 1908, 314 have been sent away to the 37 agents.

## Hart-Kraft Building Commercial Vehicles.

Under the supervision of Granville Hartman, the Hart-Kraft Motor Company is aiding in the solution of the commercial vehicle business by the production of six commercial automobiles a week, and with a standard car, a unit power plant, and



York Motor Car Company Introduces a Toy Tonneau Body for Its Four-Cylinder 40-Horsepower Chassis.



Individuality in Autocar Rear Construction.

simplified control, has found a ready market. The great difficulty of educating users of heavy horse-drawn trucks and delivery wagons has thus been obviated. A large factory has been built by the concern, and with increased facilities the rate of construction will soon be that of from 500 to 700 cars a year.

The Hart-Kraft car is equipped with a two-cylinder, double-opposed engine, developing about 12 horsepower, with a planetary transmission, giving two forward speeds and one reverse, and a double side-chain drive. The engine, transmission, differential casing and countershaft are all in a single unit, and one complete set can be substituted for another in 25 minutes. This is an important detail in commercial work where a delivery service may be handicapped if a car has to stop for a period. The testing of Hart-Kraft cars embodies some interesting features. The power unit, after being machined and assembled in the factory, is put upon a testing stand where it is first "run in" for a day with one sprocket secured so that the differential will be operated. Then it is run under its own power for a day, with its own carbureter, magneto and coil, and connected by its double side chains to a dynamo, where its power and fuel consumption is measured.

From the testing-room the power plant is moved into its chassis and the latter loaded with 600 pounds of sand. As soon as the car is taken out on the country roads it is first limbered up and then is made to climb backward up a steep hill, three-quarters of a mile long. Inasmuch as a commercial vehicle must do a great deal of reverse work in service, this test is altogether practical.

#### COMMERCIAL AND PLEASURE AUTOCARS.

ARDMORE, PA., April 20.—By combining the features of a commercial vehicle so that with the simple exchange of bodies it can be used as a pleasure car, the Autocar Company this year has had more business than it could accomplish with only day work in its large plant. In addition to this type of utility car, the company now has a line of four-cylinder, medium-priced touring cars which has proven equally popular. According to the president, David S. Ludlam, the outlook for the Autocar Company is one of the brightest in the life of the 12-year-old concern.

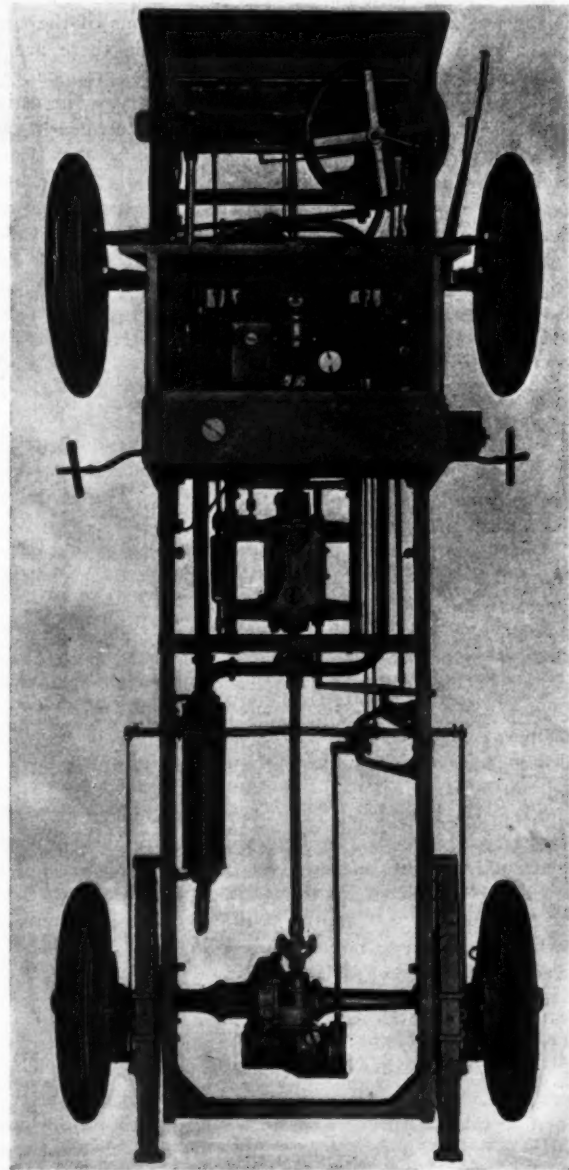
The plans for this year had called for the manufacture of 175 utility car chassis, which can be used for commercial work entirely, as delivery vehicles, taxicabs, town cars, or cabs, or with special bodies for any use, with two-cylinder engines of standard Autocar design. The reception accorded used up the first shop



Two-Cylinder Autocar with Victoria Body.

order, and 400 more of these machines will be started in July. This will carry the factory to the first of next year. In the meantime the entire force is concentrating its attention on the building of the four-cylinder car which made its debut at the Garden show. Eighteen are constructed every week, and the entire number will be 400. It is expected that by working day and night the 475 men employed will finish these touring cars by the time the raw material for the second shop order is ready.

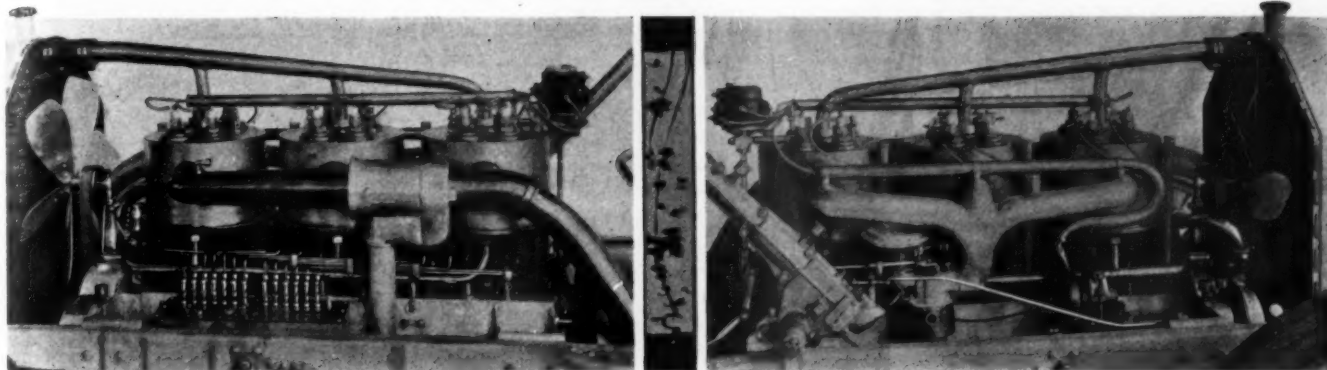
The factory of the Autocar Company has always been one of the largest in the country, but it is taxed to its utmost now. Its



Autocar Company Features a Utility Chassis.

570 machine tools are all in use, and every part of the cars is manufactured in the plant, only castings and forgings being purchased. A great deal of material for the four-cylinder cars is at present being machined, an indication of the number of cars which are constantly being sent away. The two-cylinder chassis is built in two wheelbase sizes, 85 and 97 inches, both with a carrying capacity of 2,000 pounds. The motor is more powerful than that used in the little runabouts which made the Autocar famous, 18 horsepower being developed from the 43-4 by 41-2 cylinders. Five cars with these motors were built, using surrey bodies, for experimental purposes and may at some time be added to the general line. At present only the officials of the company have them. The touring car has a motor which is rated by the A. L. A. M. at 25.6 horsepower, a three-speed transmis-





Symmetrical Exhaust and Straightaway Intake Manifolds of the Great Chadwick Six Motor.

sion, a wheelbase of 102 inches and a five-passenger body.

That the Autocar will be well represented in racing and contests this season was shown by the statements of H. M. Coale, the sales manager, who said: "We are going into all contests in our class this summer, and perhaps in some we will compete with larger and more powerful cars. It is our expectation to put a four-cylinder touring car in the endurance run of the Motor Club of Harrisburg, one in the roadability run of the Quaker City Motor Club to Atlantic City, and perhaps we will be able to take part in the run of the latter club to Pittsburg and return. We will have two of the four-cylinder cars in the 24-hour race at Point Breeze or wherever the Quaker City Club decides to hold that event, and will try to repeat our success of last year when the Autocar won."

#### GREAT CHADWICK SIX BUILT AT POTTSTOWN.

POTTSTOWN, PA., April 20.—In its new, well-lighted and airy factory building the Chadwick Engineering Works is now finishing its first lot of 50 Great Chadwick Six touring cars and roadsters. With a small output of high-priced cars it can afford to send them through at a slower rate than can the makers of the lower-priced product, so that the energy of the entire force will be employed in making and erecting 115 automobiles, 90 of which will be touring cars. The remaining 25 will be roadsters of the type which attracted a great deal of attention at the shows last winter, with the gasoline tank at the rear and exhaust ports at the side, protruding through the hood.

The factory building is just about a year old, and is such as to bring maximum results from the men and machines. The machine shops have already started upon the second order of another 50 cars, as the first order is finished and the last ones will have their bodies placed upon the chassis within two or three weeks. As an evidence of the number of cars which will be manufactured during the spring, L. S. Chadwick, vice-president, general manager and superintendent, points out the amount of raw material being machined or waiting to go through the fin-

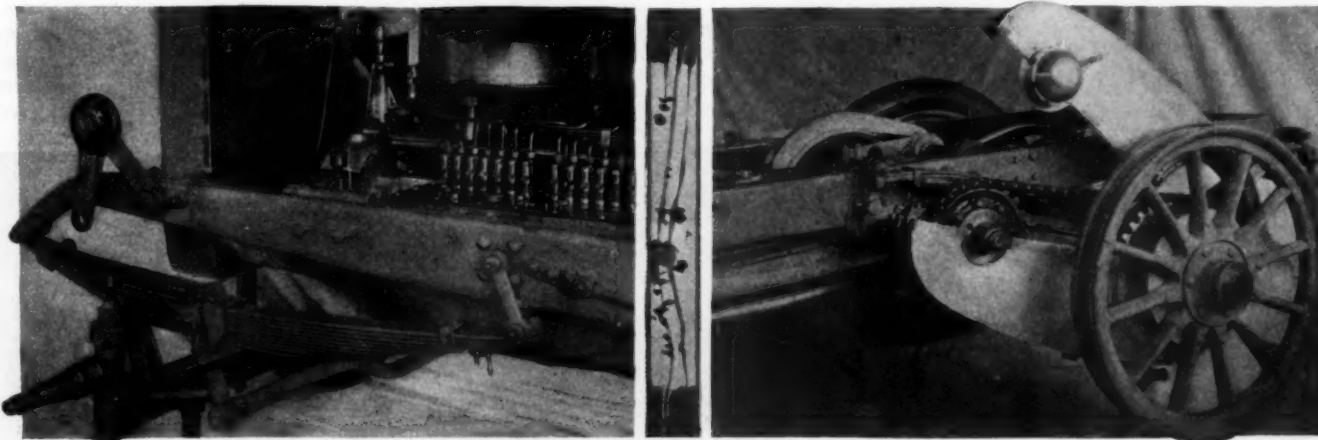
ishing processes. Cylinders, crankcases, transmissions, chain cases and smaller parts are taken in the unfinished state.

Four cars a week are being finished, using both a day and night shift of employees, and this rate can be increased when necessary. At present the concern can promise deliveries in three weeks at Pottstown, and has found the spring season opening up with a bound. Within a couple of weeks the output will be pushed up to one a day, six a week, so that the output can be completed by the first of August. There has been little change contemplated for a 1910 product, inasmuch as those which have been embodied in the present car give it about 35 per cent. more power than formerly, a higher-speed motor, valves held open longer and lifted higher, and a new carburetor contributing toward this. Both Mr. Chadwick and H. B. Larzalere, the sales manager, impress upon those who talk of the Chadwick that the present stock car is a duplicate of the car which won hill-climbs so generally and made fame for itself in the Vanderbilt race last year.

Mr. Larzalere summed up the plans for the selling season and the contesting by saying: "Our agencies have been keeping us busy in trying to give them cars for early delivery, and we fully expect that the orders now in hand for spring delivery and those which will continue to come will make us work as hard as possible. We have 20 cars now waiting for their bodies, and these will all be shipped within a few days.

"Len Zengle, who has been with the Pennsylvania Auto Motor Works, will join our forces on Monday and will probably handle our cars in hill-climbs and speed contests. Just what we will enter, however, has not been decided, for we have been waiting for the various rules to be thoroughly discussed and decided upon. We would like to enter the Cobe stock-car race if the conditions are favorable, and this is true also of the Fairmount Park, the 24-hour races in New York, for we believe in racing. We will, of course, defend our record on Giant's Despair, at Wilkes-Barre, and if Chattanooga were not so far away it is probable that we would take a trial on Lookout Mountain.

"The progress in the factory has been especially pleasing to us, for we have been rushed and still able to turn out cars under



Chadwick Constructive Details Seen In Front Spring and Axle, and Chain Case Assembly.

high pressure. We are using the whole factory building: the first floor for offices and assembling, the upper ones for machining, and motor and transmission assembling, and chassis erecting, and in the basement we have our stockroom and inspectors. Every part that goes into the car is inspected by three different men before it is allowed to pass, and very often Mr. Chadwick himself takes part in this on the most essential parts."

#### ACME AND MIDDLEBY REPRESENT READING.

READING, PA., April 21.—This city is represented in automobile manufacturing circles by two concerns, the Acme Motor Car Company and the Middleby Auto Company, building two entirely different types of cars, the former water- and the latter air-cooled. The Acme company is engaged in turning out from two to three cars a week, its estimated product for the year, according to President H. M. Sternberg, being 125 cars. These will be divided among four chassis types, the best known of which is the six-cylinder car and a four-cylinder one of 40 horsepower. The two other models are a four-cylinder touring car or roadster of 32 horsepower and a larger "Sextuplet" of 60 horsepower.

The Acme factory, which is a large one, four stories in height, is utilized in making the cars completely under one roof, nearly the whole operation, from receiving the rough castings and other materials, to the shipping of the handsome automobiles being done by the Acme mechanics. Machine work, assembling, erecting, upholstering, radiator making, and many other details of construction being attended to by the factory itself. It is but another instance of complete manufacture and the trend away from the former practice of buying parts from various concerns and then putting them together.

As to racing, a subject in which all of the manufacturers are more than ordinarily interested, Mr. Sternberg said: "We now have 120 men working in our factory, with a shift on in the evenings, and if we keep as busy throughout the spring we will have little or no time to think about racing. We have had our racing car, the one used in the Vanderbilt and Grand Prize races, overhauled and will assemble it in about 10 days. We would like to take part in some of the events on the Indianapolis speedway and perhaps at Philadelphia, in the Fairmount Park race, for we won second place in that last year. If the conditions are such that we can enter at Chicago for the Cobe race, it is possible that our sextuplet may be purchased by a Chicago autoist and entered by him. We do not expect to take any part in endurance contests, but we may be in the 24-hour races in New York."

The Middleby company, presided over by J. Middleby, Jr., has taken hold of the old Duryea plant, and with new machine tools and certain improvements has established one of the busiest small automobile factories in the country. The history of it is interesting, as showing the public demand for a car of the type which it is producing, at the rate of six or seven a week. Mr. Middleby took hold of the buildings, equipped them with the latest machinery, turret lathes, shapers, grinders, drill presses, etc., and put the first car, a four-cylinder, air-cooled one of 25 horsepower, on the roads on August 2, 1908. No agencies were established until November, and chassis No. 213 was put upon its erecting frame to-day, with the cars turned out in numerical order. A seasonal output of about 400 automobiles has been predicted.

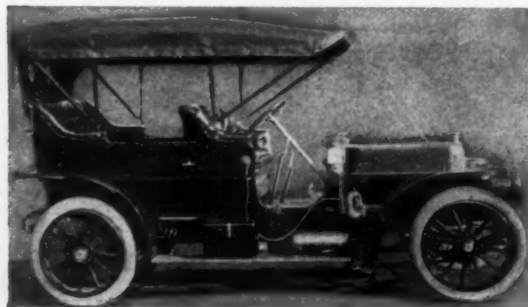
#### PENNSYLVANIA ACTIVE AT BRYN MAWR.

BRYN MAWR, PA., April 21.—Concrete construction in automobile factories, tending to lessen vibration and noise, is exemplified by that of the Pennsylvania Auto Motor Works, which builds the Pennsylvania cars. The quietness of the factory, while the regular work progresses, is a feature that instantly attracts attention, for as the machine tools do their work and the assembling and finishing of cars go on, there is not the great amount of deafening noise common in other plants. The Pennsylvania company has but recently completed its new factory, and it now has about 85,000 square feet of floor space. A production of from 750 to 800 cars is planned as the total for the present season, although it is distinctly understood, by those connected with the firm, that the seasons and years are not recognized in the working of the factory. New models may be introduced at any time.

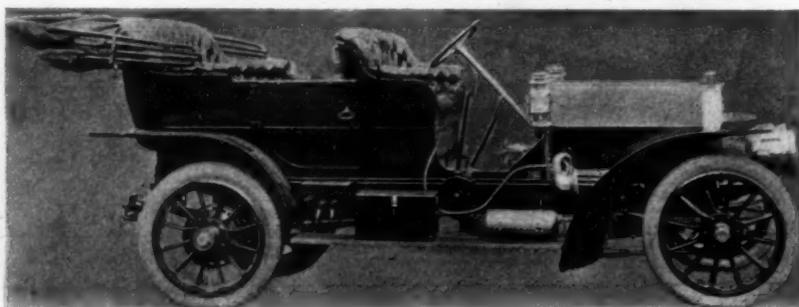
Three models are at present being constructed: a six-cylinder car of 75 horsepower; a four-cylinder car of 50 horsepower, and a four-cylinder car of 25 horsepower. The first and third are new models, while the second is the type which has been made for two years. Two new models will be turned out in about three weeks or a month, and these five constitute the complete line for the present. The new cars will be known as Models B and D6. The former will be a seven-passenger touring car with a four-cylinder engine, 4 7-8 by 5 1-4-inch cylinders, and a wheelbase of 122 inches, to sell for \$3,200; while the six-cylinder car will have cylinders 4 1-4 by 4 1-4 inches in size and a wheelbase of 131 inches, to sell for \$3,500.

R. Harry Croninger, the general manager, speaking of the general conditions at the plant, stated: "It is probable that by June 1 we shall have built 200 of the smallest cars, those selling for \$2,100, with baby-tonneau bodies; 150 of the 50-horsepower cars, which sell for \$3,000, and about 50 of the six-cylinder machines. We build our cars only to order, but the orders have recently been arriving faster than we can ship, and so at present we are 15 cars behind on our six-cylinder type and 30 on the small cars, while on the '50' we are holding our own. We have no piecework, every one of our 250 employees being on salary.

"We intend to go into all of the contests in our class, with three cars: a six and both sizes of fours. It is not planned to use either of the new models for we shall be busy constructing them to order. Gabriel, who is the foreman of the Quinby factory, and who has taken part in a number of European races, will probably handle the 75-horsepower car, but we have not decided who will drive the other two. We will not compete on circular tracks nor enter endurance runs under the present rules, but we will go into speed trials and hill-climbs. What I would like to see is a type of contest which would prove dependability, power and speed and put an end to 'axle fakirs.' I would suggest that there should be an endurance run to Wilkes-Barre, via Reading, with time schedules, intermediate controls, but not a technical examination which would penalize for little things that might happen in touring. At Wilkes-Barre I would have the cars locked up and then on the following day enter the machines in the hill-climb on Giants' Despair according to their various classes and make them climb with the same load carried on the run from Philadelphia. On the third day, the machines would be run to Canandensis, in the Pocono Mountains, where there would be a speed trial, again entering the cars in their classes.



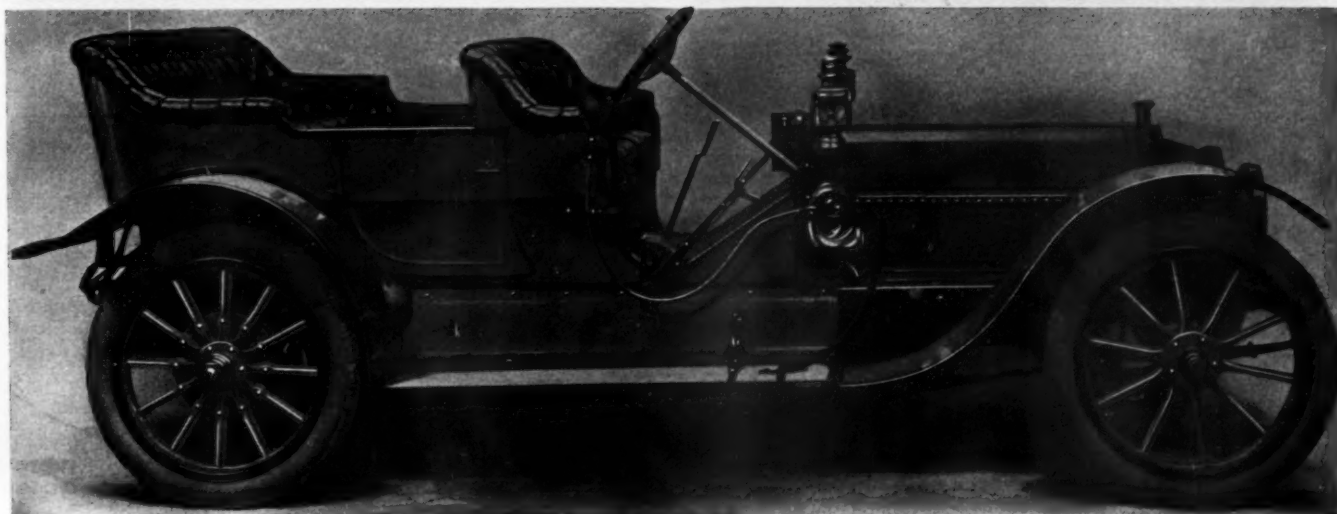
The Smallest Pennsylvania, 25-Horsepower.



Another of the Pennsylvania Family—50-Horsepower.



## About the Matheson Six-Cylinder



Latest Creation of the Matheson Automobile Company—A Light Six-Cylinder Touring Car of 50-Horsepower.

NEW YORK, April 19.—Matheson "Light Six" is here, with the consequent result that the selling headquarters of the Matheson Automobile Company, 1886-1888 Broadway, has been one of the busiest places in the automobile district during the past few days. The car which has arrived is the first to be delivered since the type made its début at the shows. Two models were then announced to come from the Wilkes-Barre factory for the 1909 season. The "fours" were then deliverable, and now the "sixes" are being made and shipped in considerable numbers.

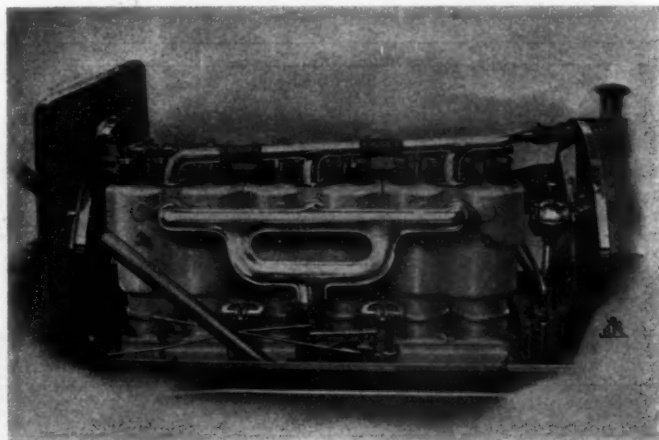
A feature construction has been assiduously avoided in the design of the six, although it differs materially from the type of the present four, or of the six-cylinder car which was made two years ago. The changes have been made chiefly in motor- and transmission-gear construction, with their various appliances, but the workmanship is of the same standard and the experimental cars so thoroughly tried on the northeastern Pennsylvania mountains that the deep confidence of the Matheson company is reposed in the latest production of their factory.

**Description of the Engine.**—The notable feature of the six-cylinder engine is in its valve action, which has been materially changed from previous practice, although in nowise detracting from the latter. The valves, all in the head and at the right side, are operated through depression from overhead beams,

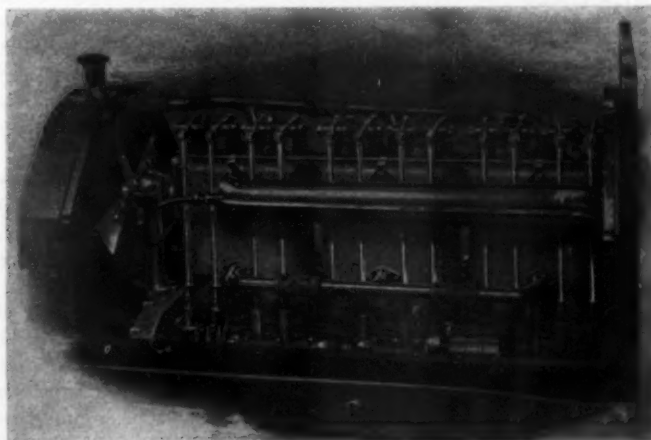
which, in turn, are raised by lifters from a single camshaft in the crankcase on the left side. The valves, 2 3/8 inches in diameter, are all interchangeable, electrically welded to their stems, and have flat faces. The lifter rods have screw adjustments.

The six cylinders are cast in sets, three dual units to each engine, with a bore of 4 1/2 inches and a stroke of 5, rated by the Matheson company at 50 horsepower. They are enameled to give the same clean appearance, as are all cylinders of this make, with the intake manifold on the right side and exhaust on the left. The carburetor is of special design, of the multiple-jet type, which has proven successful on previous models, with a control both from the top of the steering column and from a foot throttle. The crankshaft is offset 3/4 of an inch, running on four bearings, the front one being an annular Hess-Bright ball bearing and the others of plain phosphor bronze.

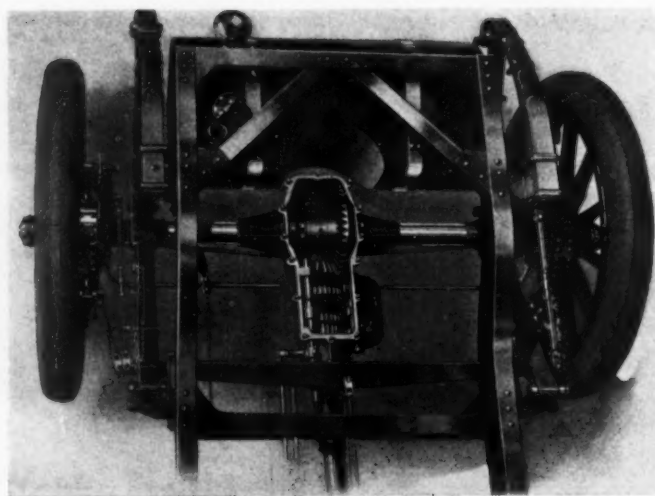
**Lubrication System.**—Special attention has been given to the lubrication system for the motor, the rear construction, of course, taking care of itself. Splash in the crankcase is supplemented by a three-lead Lavigne mechanical oiler, situated on the left side, just behind the first crankcase arm, and driven from enclosed gears. The oiler, water pump and magneto are placed in the order named on the left side, and a single shaft with intermediate couplings drives them 1 1/2 times the motor speed. Each



Intake Side of New Motor Showing Carburetor.



Exhaust Side Showing Oiler-Pump-Magneto Arrangement.



Rear Construction with Transmission Uncovered.

of the oiler-leads branch into pipes to the various cylinders or bearings; one lead forcing lubricant to the three plain crankshaft bearings; one branching into six, to supply oil to grooves in each of the cylinders, and the third has six oil pipes arranged to drip upon the lower ends of the connecting rods as they move.

**High-Tension Ignition Used.**—An innovation for Matheson cars is the use of high-tension, jump-spark ignition, with plugs placed in the right side of the cylinder castings and obtaining current from a Bosch magneto.

A standard water-cooling system is embodied, with a centrifugal pump, cellular radiator and gear-driven aluminum fan. The radiator is the same shape as that characteristic of the Matheson, of ample size, with large piping to the tops of the cylinders and to the pump. The latter has an aluminum casing, bronze impeller and steel shaft, driven, as stated above, from the oiler-pump-magneto shaft, and forcing its water into the jackets on the left side at the bottom. The fan, which consists of six aluminum arms riveted to the hub casting, is 16 inches in diameter, and is driven through bevel gears from the crankshaft with a 2 to 1 reduction. To take up any sudden motion on the part of the engine a spiral-jaw clutch is interposed.

An 18-inch flywheel, mounted on the rear of the crankshaft, contains the multiple-disk clutch in an oil-tight casing. There are 51 flat steel disks in the assembly, the rings have alternately eight notches and eight lugs, forced together by a spring which gives a load of 140 pounds. A tubular rocker sleeve is used to connect with the clutch-foot-pedal, and the arms are long enough to give an easy and delicate action. The entire front of the chassis, from the radiator to the flywheel, is protected from road dirt by the extension of the motor base to the side of the frame.

**Transmission Integral with Rear Construction.**—Shaft drive, with a three-forward and one reverse speed, selective sliding-gear transmission, located in a crucible-steel casting together with the bevel driving gear and the differential, and a full floating rear axle constitute the transmission construction. Thus there is nothing between the clutch and the rear axle, except the propeller shaft, which is of solid steel, 1 5/8 inches in diameter, squared at both ends. This shaft runs in a casting, which is at once the strut and the torsion tube, performing the functions of the latter through a globe-end fastened to frame cross-girt. Deflections are compensated for by a suitable device. The transmission shafts run on sets of ball bearings, with thrust bearings located advantageously. The two sliding gears are made of chrome nickel steel and all other gears are of nickel steel, oil tempered, with 7-8 of an inch face. On high speed the drive is direct to the bevel pinion and gear, the whole construction of which can be readily reached for inspection by removing the cover. The differential is of the bevel-gear type. The drive from the bevel-gear housing to the wheels is through floating live axles, made of nickel steel, of 1 1/4 inch diameter, with

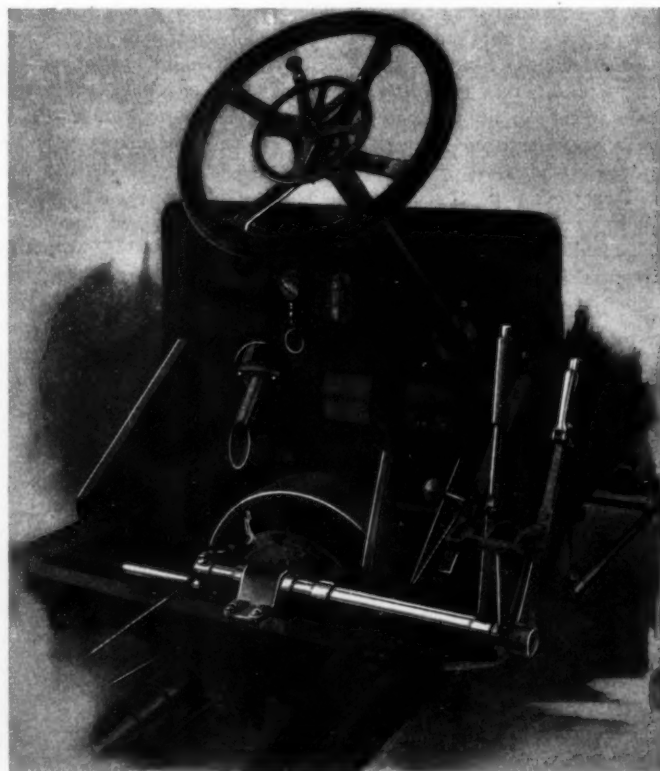
squared ends, and oil tempered. Six-tooth nickel-steel clutches form the connection between the shafts and the wheel hubs. The whole rear construction of the new cars is of special Matheson make—no means was spared to test it in preliminary work and it showed its worth and was adopted.

The front axle is by Timken, I-section, a single drop-forging without welds, with adjustable roller bearings. Half-elliptic springs are employed in front and three-quarter-elliptic in the rear, the former being 34 inches long, with seven leaves, joined to the sideframe eyes in front and linked at the rear; the latter springs are extra long and strong, to insure ease in riding, the lower member having eight leaves and is 40 inches long, linked to the chassis frame, and the upper member also has eight leaves, 21 1/2 inches long, from the scroll-spring eye at the rear to a chassis bracket in front. Oil holes and oil screws are provided.

**Minute Attention to Important Details.**—Brakes, control mechanism, steering and the other parts of automobiles which must be given the most accurate consideration in designing and building have been thoroughly attended to in the Matheson cars in general and in this model in particular. There are two sets of brakes, both operating on the rear wheels, one set being expanding and the other contracting. The drum is 2 inches wide and 14 inches in outside diameter. The internal set is applied by the the right foot-pedal and the other by a side lever, but between these and the brakes themselves are interposed brake-eveners. Within the drums are located the hold-back pawl and ratchet controlled by a foot-pedal on the toe-board.

An irreversible steering action, through a hardened worm and sector, is obtained and the steering cross-rod placed behind the front axle. The knuckles are all drop forgings, fitted with grease and oil cups. The spark and throttle levers are situated upon the top of the steering post and are stationary.

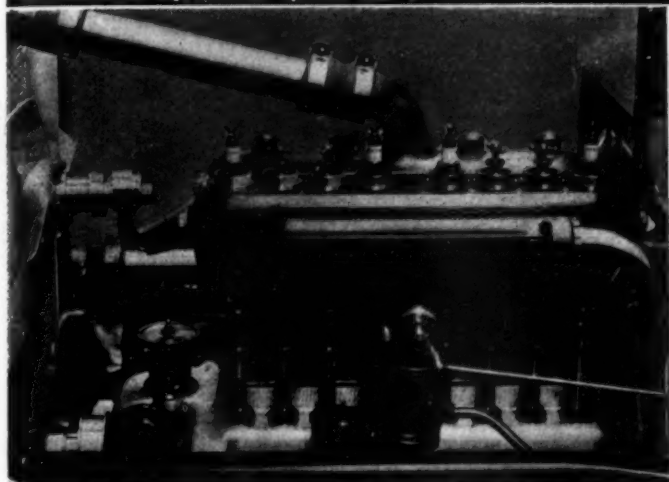
The new "six" is fitted with a five-passenger body which much resembles the toy tonneau type, because of its low, rakish appearance, and in color and general lines follows standard Matheson practice. The upholstery is of high-grade leather, with tufted seats and backs; the fenders and running board are enclosed; the gasoline tank is fastened to the pressed-steel frame at the rear, and the wheels are 36 inches in diameter, using 4-inch tires.



Control Mechanism and Unobstructed Dash.



# A Franco-British Newcomer



The Motor Shows Clean and Natty Proportions.

LONDON, April 10.—At the Manchester show a number of cars were shown for the first time, and none attracted more attention than the F. L., which, although the product of a famous French house and built complete in the shops across the Channel, R. M. Wright & Co. have taken the exclusive rights to it, and they propose to sell only in England. This makes the car practically a British product.

Placed alongside of other cars, the feature which is most apparent is the neat yet extremely simple lines of the whole chassis. Beginning with the motor and carrying right through to the back axle and rear construction, every piece shows this tendency toward simplification. Moreover, ease of adjustment and facility of dismantling have been most carefully kept in view, so that for such service as taxicabs, the whole construction is ideal, as the removal of any part is a matter of minutes.

**Engine Has a Straightforward Appearance.**—As the view of the left or valve side of the motor shows, the cylinders are cast *en bloc*. The exhaust is not cast integral, but is a simple ribbed casting attached by three bolts to the machined face of the cylinder. The valves are grouped on the one side, with the carbureter placed low down on that side. The inlet pipe is integral with the exhaust, and so carefully worked out that at first glance, there does not appear to be any inlet. The carbureter is attached to this in such a manner that it can be removed in a minute or can be rotated out of the way without disconnecting it. Double ignition is fitted with the timer located at the left, forward, and driven from the camshaft. The high-tension magneto is placed on the other side, at right angles to the motor, and is driven from the crankshaft. It is very accessible, and may be removed in less than a minute without disturbing anything.

The engine is of the four-cylinder type, with 80 mm. (3.15") bore and 100 mm. (3.94") stroke. The rating is 12-16, the latter being the R. A. C. rating for this bore. The under portion of the crank chamber, flywheel pit and lower half of the gearbox is in one aluminum casting, which forms its own underpan, and is carried directly on the main frame side members. Cooling is by thermosiphon, the outlet from engine to the top of the radiator being a single straight pipe of large diameter. The return is lower down on the other side, and is also of large diameter and free from bends, only one being necessary. The cooling is assisted by a large sized fan, belt driven from the crankshaft, and hung from the cylinder block on an I-section bracket.

**Lubrication Well Cared For.**—The engine is lubricated by the pressure system, the oil being forced by a gear-driven pump

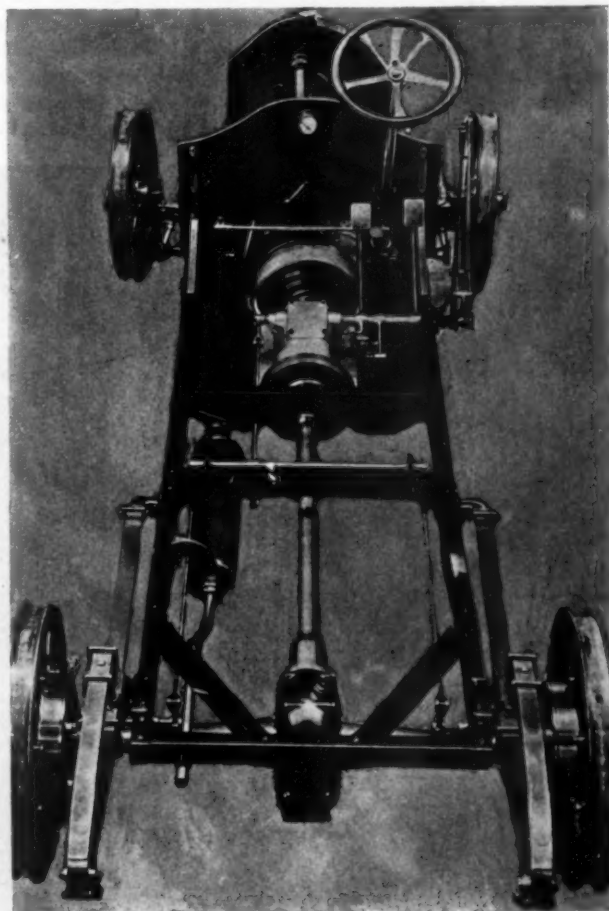
through the drilled shaft and to the reservoir on the dash, from whence it flows by gravity to all other places. This reservoir is placed on the engine side of the dash, so as to conform to the modern desire for a clean dash on the driver's side. A dial indicator shows the amount of lubricant on hand.

The transmission gives three speeds and reverse, with the usual direct drive on the high. From this the drive is by means of a cardan shaft enclosed in a very large tube and turning on ball bearings. The rear wheels carry a pair of brakes, enclosed and of the internal expanding type. These and the footbrake on the mainshaft are operated by adjustable means, all of the pedals being quickly changed, while the hand levers can also be changed to suit the operator's physique.

**One-Lever Control Is Featured.**—The steering-post control of the engine follows the practice inaugurated by Renault in the use of one lever. The spark advance is fixed and the single lever provided works the throttle. The steering wheel is of the four-segment design, with an original method of assembling.

The frame is of pressed steel, and has a liberal section. There are two bends, one at the dash to allow of a large steering lock and to dispense with a sub-frame. The other is just forward of the rear axle, and is designed to lower the center of gravity. The springs follow usual practice, with three-quarter elliptics in the rear. The wheels are large and fitted with good-sized tires.

The chassis form, the F. L. sells at £285 (\$1,400), and with the body fitted the price is £350 (\$1,700), so that it comes in the so-called popular class of four-cylinder cars.



View of the Chassis and Rear Construction.

## HOW STEVENS-DURYEA USES TEST-BLOCK ENGINES

By JOHN W. FEW, Jr.

**C**HICOPEE FALLS, MASS., April 19.—Most interesting is the practical and economical use of the engines placed on the testing block at the Stevens-Duryea plant, and it also illustrates how the cost of a car can be reduced through improved equipment and factory organization. The well-equipped factory to-day cannot only do better work than formerly, but it can do the same work at much less cost.

Two years ago the writer was much interested in seeing the engines on the testing block churn up great quantities of water in a huge tank to show "what they could do." The power was there; but it was all wasted. The water was simply being used as a resistance. Now all is changed. There is the same roar of turning machinery as the fifteen or more engines strain at their blocks, but the energy, instead of being dissipated uselessly in water, is conserved by dynamos and used to drive the machinery in the building. Each engine is placed on a separate frame and attached to a Westinghouse direct-current motor of 17 kilowatts capacity, but capable of a considerable overload. When the engine is first put on the stand it is run in by the motor. After a complete limbering up the engine under test is required to drive the motor for a number of hours, developing about 38 horsepower. The engine is then taken down; that is, the main bearings are all taken apart and examined to see if any wear has developed, and every moving part is minutely examined before reassembling. After this the engine must make a continuous run of 10 hours, driving the motor and must produce 38 horsepower or over all the time. Located above the testing frames is a large switchboard, the gauges of which are numbered to correspond to the numbers on each frame. At a glance the output of each machine can be seen.

Great care has been exercised that in the operation of the engines conditions shall approximate those obtained in actual usage. Gasoline, which is stored in a 400-gallon tank, is delivered to the engine with the same flow and pressure that exists in the complete machine. This is secured by the use of an auxiliary tank containing two gallons. By the use of a ball valve the flow is

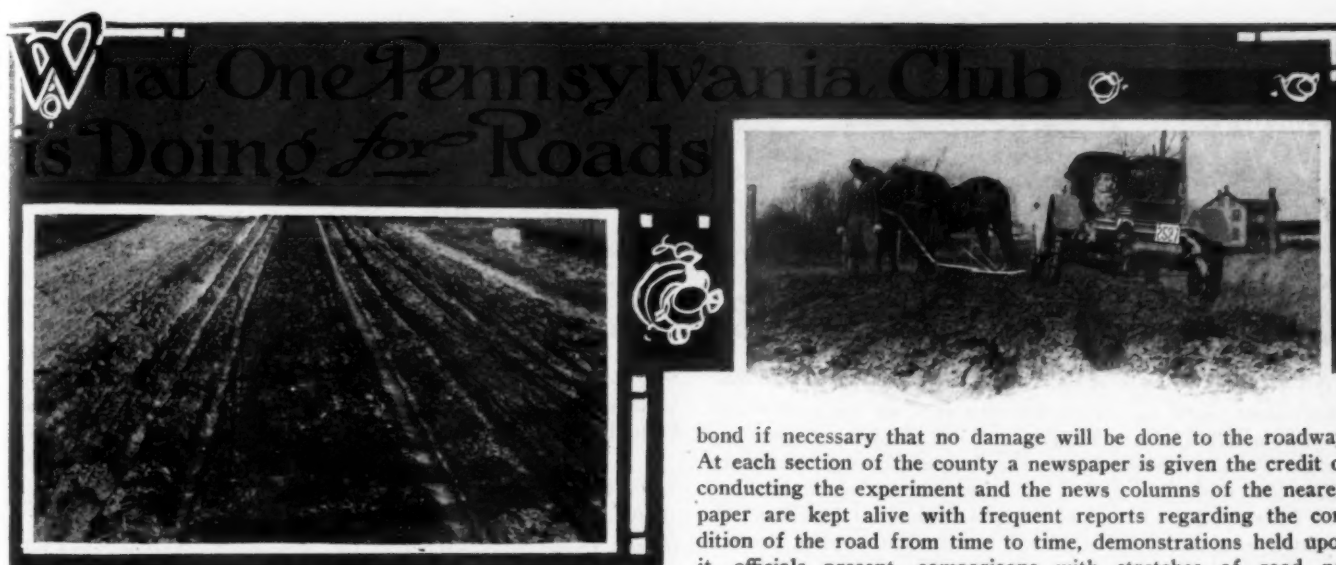
regulated and the carbureter works under the same condition as in actual service. The cooling system has been worked out with the same care. While the radiator is missing, a large tank is connected up to the engine and insures a sufficient cooling medium. An auxiliary pump is interposed in the system to insure that the head of water and pressure is the same as when the motor is on the road. The current generated by the engine is used in the factory and the output of the fifteen or more engines, each producing 38 horsepower, is no small item of economy. A 75-horsepower generator, with suitable governor, is also connected up in series, so that when a number of engines are being changed at the same time and the output consequently diminished it can take up the load and the work goes merrily on. The efficiency of the system in furnishing power was put to a test not long ago. The large generator broke down and for several days was out of commission. By extra efforts on the part of the testing force to keep the 18 stands full, the machines under test furnished sufficient power to run the plant without one instant of stoppage or the secession of one machine unnecessarily. Thus, the utility of this apparently useless work was proved to the satisfaction of every one concerned.

Although the engines get such a careful test on the blocks they are further tested on the road. After being fitted to a chassis they are driven for three or four hours, then taken apart and once more examined for wear, valves again ground and then once more are taken on the road and tuned up by the tester. If the engine performs to his satisfaction he turns it over to the head tester, who once again takes the car on the road and makes it do "stunts." It must throttle down to a snail's pace on the high, pick up on the spark, and take certain hills on direct drive. Out of respect to the law in Massachusetts, nothing will be said as to the speed required. After this the car receives the regular body and equipment and is again taken on the road for a short run. This is to determine that everything is right. While some of these tests appear to be useless, it is only an indication of the painstaking care practised at the factory to insure a perfect car.



Stevens-Duryea Testing Room—Six-Cylinder Engines in Foreground, Fours in Rear—Electrical Gauges and Testing Apparatus Overhead.





**L**ANCASTER, PA., April 19.—Depending upon the newspapers of the county and the spirited enthusiasm of its members, the Lancaster Automobile Club has inaugurated a system of good roads improvement that bids fair to eclipse the efforts of any other automobile club up to date. The most striking thing about the whole movement is that it is so practical and is meeting with the hearty cooperation of the farmer element. Lancaster county has over 1,000 miles of public highway and is divided into 40 townships and nearly that many cities and boroughs. Each of these localities is presided over by its road officials. Scattered throughout the county are 30 newspapers and the club's plan is carried out as follows:

The consent of each of the road officials is gained to permit a one-mile stretch of dirt roadway to be dragged by a King Split-Log road drag for a period of 20 hours of labor all told, the dragging being done after each rain by farmers who live at convenient localities. The club supplies the drag, pays the farmer who drags the road and agrees to make good by a \$500

bond if necessary that no damage will be done to the roadway. At each section of the county a newspaper is given the credit of conducting the experiment and the news columns of the nearest paper are kept alive with frequent reports regarding the condition of the road from time to time, demonstrations held upon it, officials present, comparisons with stretches of road not dragged, etc.

Newspaper correspondence is solicited from the farmers living in the neighborhood of the demonstration and they are afforded every opportunity to drive over the newly dragged road and examine its condition.

One board of supervisors from the township of East Lampeter were so set against this method of road improvement at first that they put the matter into the hands of their lawyers, who notified the club that if any such means of working their township roadways was adopted they would prosecute those who might do the work. By dint of tact and perseverance on the part of the good-roads committee and the club's solicitor, this board of objecting supervisors finally permitted the club to carry on its work. Over 2,000 four-page pamphlets describing in detail the method of constructing a road drag have been distributed to the farmers. The county of Lancaster is becoming a beehive of good-roads industry, and the progressive plan of the automobile club gives every evidence of being the right remedy for "Good Roads Now," which is the campaign slogan of the autoists.

## GOOD ROADS TALK FREQUENT NOWADAYS IN CONGRESS

**W**ASHINGTON, D. C., April 19.—The good roads movement has no greater advocate in Congress than Representative William Sulzer, of New York. During the past week he delivered a strong speech on the subject, stating among other things that national aid for good roads is demanded by the people, and the question will grow more and more important as the seasons come and go until the demands of the people are granted by the national government. The following excerpts from Mr. Sulzer's able address are of pertinent interest:

"Good roads mean progress and prosperity, a benefit to the people who live in the cities, an advantage to the people who live in the country, and it will help every section of our vast domain. Good roads, like good streets, make habitation among them most desirable; they enhance the value of farm lands, facilitate transportation, and add untold wealth to the country. Good roads have a money value far beyond our ordinary conception. Bad roads constitute our greatest drawback to internal development.

"The direct connection between good roads and the value of farm lands is shown in a striking manner by the United States Department of Agriculture. The returns received by the department from various States show that in nearly every case the States having the highest percentage of improved roads have the largest population per mile of road, thus showing that better roads are a powerful factor in encouraging the settlement of unused lands, especially in sparsely populated sections of the country. A comparison of the percentage of the improved roads

of the various States shows that the average percentage of the improved roads in all States where farm land is worth less than \$20 an acre is only 1.8 per cent.; whereas in the States where the acreage value is more than \$20, improved roads constitute an average of 9 per cent. of the total mileage.

"The farsighted wisdom of Julius Cæsar built from the Imperial exchequer the magnificent roads that led in all directions to eternal Rome. The great Napoleon—Cæsar like—built the roads of France that center in Paris from the general funds of the government; and these French roads have done more than any other single agency to encourage the thrift and increase the industry of the people of France. Cæsar and Napoleon were the great road builders of ancient and modern times, and their foresight and their judgment and their work demonstrated the beneficial results that follow like the night the day the building of great governmental highways."

## TOLL ROAD'S CONDITION PROTESTED.

**WILMINGTON, DEL.,** April 19.—Alleging that the Philadelphia and Wilmington turnpike is in bad condition, some of the users of the road have taken steps to try to have it improved or the taking of toll thereon stopped. A petition has been drawn up by Robert L. Baldwin, who uses the road, and it has been signed by a number of others. An inquiry will follow, and that will determine the petitioners' rights.

# What the Clubs are Doing These Days

## MARYLAND WILL WELCOME PENNSYLVANIANS.

BALTIMORE, April 19.—These are busy days for the members of the Automobile Club of Maryland. Their request to Secretary of State Winslow Williams that the members of the Harrisburg Automobile Club who are to participate in the endurance run from Harrisburg to Scranton, through sections of Maryland, be permitted to operate their machines in this State without having to procure a Maryland license, has been granted. The certificate of concession issued by the Secretary of State stipulates, however, that the visiting autoists will be subjected to all other State laws and regulations.

Members of the local club are planning to entertain the visitors during their stay in Baltimore. A delegation will meet the Harrisburg motorists at Relay, on their way from Washington to Baltimore, and escort both the pilot and chairman cars to this city. The checking station will be at the Automobile Club of Maryland quarters.

Two more councils of the State Association of Motorists, the organization which intends to look after proper and just legislation for Maryland owners, were organized during the week. These were the Salisbury and Elkton councils, the latter being in the home city of Governor Crothers, who favors the Swann Bill, which caused such a stir among owners until some of its original provisions were modified.

## A. C. OF HARTFORD ELECTS NEW OFFICERS.

HARTFORD, CONN., April 19.—At the annual meeting of the Automobile Club of Hartford, held last Wednesday evening at the headquarters in the Allyn House, General Wallace T. Fenn was elected president; Thomas W. Russell, vice-president; C. D. Alton, Jr., was re-elected treasurer, and Arthur G. Hinckley was elected secretary. The election of the new officers puts into effect the recommendation of the committee on the expansion of the club at the meeting on March 26, that the officers be automobile owners, and not allied with the trade or industry in any professional capacity.

The committee on new quarters recommended a location on the ground floor of the Allyn House, to take the place of the present quarters on the second floor. The membership report showed a present membership of 318, one member having been dismissed for violation of the automobile law. The annual dues for old members have been increased from \$5 to \$10, and for new members to \$15. Following the close of the regular order of business, former President J. Howard Morse, who has just returned from a two years' stay abroad, gave an interesting talk on his automobiling experiences in Africa.

## WORCESTER'S DEAD HORSE CLIMB JUNE 17.

WORCESTER, MASS., April 17.—The board of governors of the Worcester Automobile Club has decided to hold the annual hill climb on Dead Horse Hill, Saturday, June 17. This comes on a date when there is no other event of similar character scheduled in New England, and it is expected that the entries will be exceptionally large, as last year's event was an unqualified success. The committee consists of President John P. Coghlin, Daniel F. Gay and Albert H. Inman.

For several weeks the club has been considering an independent hill for the climb. It is realized that with the high-power cars this year Dead Horse is not as stiff a proposition as is desired, and it was thought that if a private hill could be secured it could be used as a recognized hill on which to hold tests, there being no place in New England where a car can be tested without violation of the speed laws. To build a hill a mile in length would cost about

\$15,000, and the club could not get such a proposition under way in time for a climb this year. It was finally decided to utilize Dead Horse Hill for this year's contest.

## MINNEAPOLIS CLUB HAS 804 MEMBERS.

MINNEAPOLIS, MINN., April 19.—Horace Lowry was unanimously re-elected president of the Minneapolis Automobile Club at the annual meeting. The other officers named were: First vice-president, C. F. Haglin; second vice-president, S. M. Colburn; secretary (re-elected), G. H. Seeley; treasurer (re-elected), J. H. Riheldaffer. Of 14 candidates for the board of directors, Dr. C. E. Dutton, G. H. Seeley, H. E. Pence and Frank Cook were elected. President Lowry announced the appointment of the chairmen of committees as: House, H. E. Pence; good roads, G. A. Will; sign posting, Harold Vorce; legislation, Dr. C. H. Kohler; membership, E. L. Brown; tours and contests, Dr. C. E. Dutton.

During the past year 326 new members have been received into the organization, bringing the total to 804; and in other lines the club has been similarly successful.

## LOUISVILLE CLUB HAS DOUBLED MEMBERSHIP.

LOUISVILLE, KY., April 19.—Improvement in country roads and the generous erection of signposts in Jefferson county were advocated at the annual banquet and meeting of the Louisville Automobile Club. The new officers are: President, J. T. Ross; first vice-president, H. E. Tuley; second vice-president, R. E. Morris; secretary, E. J. Straus; treasurer, W. I. Kohn; directors to the State association, G. S. Barnett, Prince Wells, Lee Miles, Dr. R. L. Ireland, J. M. Chatterton.

The willingness of the municipal park board to an increase of the speed limit from 12 to 15 miles an hour was signified, and also its intention to construct stone bridges in Cherokee Park. Committees were appointed by the newly elected president to take up the matter of road improvement and signposting. The club now has a total membership of 205, double the number on the lists a year ago.

## GENEVA (N. Y.) CLUB WILL HAVE SUMMER RUN.

GENEVA, N. Y., April 19.—At a meeting of the Geneva Automobile Club, held recently, the resignation of President Herenden, who is going to Europe, was accepted, and the following members elected to office for the ensuing year: President, W. L. Fay; vice-president, E. S. Sigler; secretary and treasurer, C. W. Fairfax; executive committee, G. M. B. Hawley, Dr. W. H. Jordan, H. L. Rose. Good roads and the regulations of speed were subjects which were discussed and plans for the summer run were also taken under consideration.

## SPRING ACTIVITY OF CANADIAN AUTOISTS.

MONTREAL, CAN., April 19.—With the opening of the spring touring season, the Automobile Club of Canada has outlined a number of lines of activity. One of these deals with the dust nuisance, and together with the municipalities between this city and St. Anne's on the lake shore, it has arranged to oil roads most used by autoists. In connection with road work, it has



been planned to post signs between Montreal and Rouse's Point, thus forming marked touring routes with those coming from the United States. Arrangements have not been fully completed for the three days' race meet to be held on the Blue Bonnets track. It is expected, however, that this will be made a very important event and will be entered by a number of prominent drivers.

#### JAMESTOWN (N. Y.) CLUB PLANS MANY EVENTS.

JAMESTOWN, N. Y., April 19.—These officers for the coming year were chosen by the Jamestown Automobile Club at its annual meeting: President, W. J. Maddox; vice-president, Fletcher Goodwill; secretary, Louis C. Breed; treasurer, B. D. Phillips; trustees, Peter H. Hoyt, S. B. Broadhead, Oscar Stranburg, Dr. W. E. Goucher, H. W. Fenton, W. A. Marson, J. H. Wright, F. O. Anderson, C. O. Pickard, D. H. Grandin, F. P. Hall, W. W. Hunt.

An effort is being made to increase the membership, and plans have been made for a series of events for the summer, including a parade at an early date, races in July, club runs to places of interest and improvements in the neighboring roads.

#### FIRST ANNUAL MEETING OF NEW HAVEN CLUB.

NEW HAVEN, CONN., April 19.—The New Haven Automobile Club celebrated its first annual meeting and birthday at Savin Rock, last Wednesday evening, combining the election of officers with a smoker and Dutch supper. Nearly all of the 200 members attended. The officers chosen are: President, Thomas G. Bennett, re-elected; vice-president, J. P. Goodhart; secretary, W. T. Dill; treasurer, C. E. Thompson; board of governors: T. G. Bennett, J. P. Goodhart, W. T. Dill, F. G. P. Barnes, C. M. Robinson, P. S. Thompson, A. L. Chamberlain. Chairman of committees: Legal, C. M. Robinson; membership, P. S. Thompson; contest, W. A. Maynard; good roads, F. G. P. Barnes; sign posts, A. L. Chamberlain.

#### A PICTURESQUE PENNSYLVANIA ROUTE.

NORRISTOWN, PA., April 19.—Passing through the most prosperous, as well as the most historic, part of the State of Pennsylvania, the route chosen for the second annual endurance run of the Norristown Automobile Club has elicited a widespread interest. Members of the local organization and automobilists from many parts of the surrounding country have decided to join with the contest simply because of the pictorial nature of the country to be covered, as aside from the contesting spirit. Four hundred miles of highway will be traveled in the run of two days' duration to Hagerstown, Md., and return, on May 18 and 19.

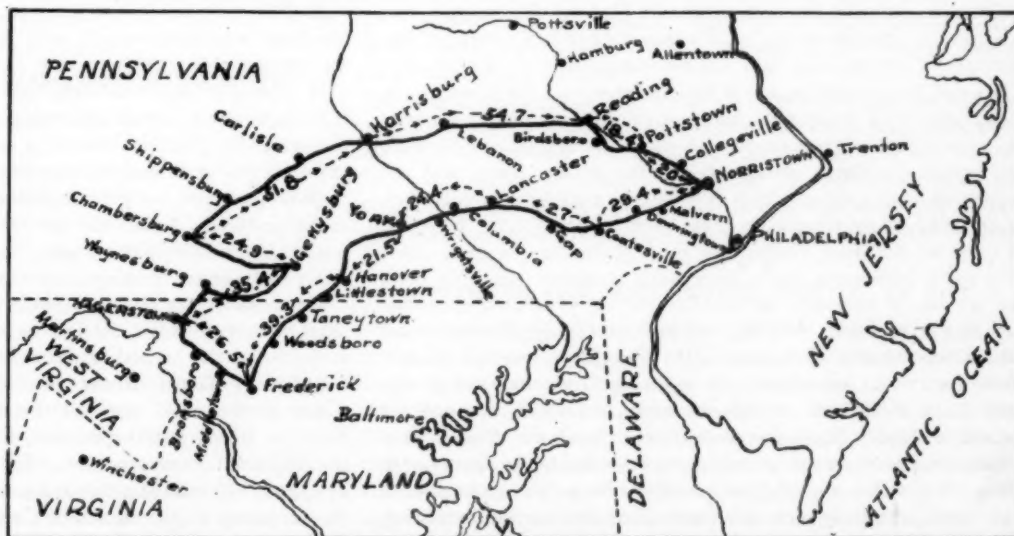
Starting from this city, the tourists will cross the Schuylkill River, to the Lancaster pike, and turn westward toward Downingtown, a portion of the Chester valley which is bordered on the south by the Hundred-Mile Woods, and on the north by the Valley Forge hills. The famous old road is followed through Coatesville, skirting the Welsh mountains, in which some beautiful views of the prosperous Lancaster county will be gained. The general direction of the proposed State highway from Philadelphia to Pittsburg is taken, and most of the distance is over some of the roads which are included in

the plans. At Lancaster the contestants will continue due west to Columbia, where they will cross the mile-and-a-quarter-long bridge over the Susquehanna River. A rich farming country is traversed to and beyond York, and the Blue Ridge mountains will be seen in the distance. The first reminders of the historical ground will be seen at Hanover, in the center of which place is a large monument to the soldiers who fell at Gettysburg, and shortly after passing through Littlestown the Mason and Dixon line is crossed, into Frederick county, Maryland.

In Frederick, the site of Barbara Frietchie's house will be passed, and the route takes a slight northerly turn, crossing the Catcoctin mountains at Braddock Heights. The views will be well worth the trip, for a descent is made, into the fertile Middletown valley, over a natural switchback road, with the Blue mountains but a few miles away. A climb of three and a half miles to the top of Bolivar mountain, close to the battlefield of South Mountain, will furnish a real test for the automobiles. Historic spots are everywhere made known by the Government signs, Harper's Ferry to the south, and Antietam to the west. Hagerstown, the night stop, has ample facilities.

The homeward-bound trip is commenced in a northeastern direction, soon the Mason and Dixon line is re-crossed, and Waynesboro is the first place of size entered. Another climb of three and a half miles to the summit of the Blue Ridge, through Penn Mawr, by the Blue Ridge Mountain House and Chariman, will reveal to those who have never taken the trip some of the most splendid views in the East, the valleys on both sides being easily seen just at the summit. The descent will be made through Monterey Gap, over the road which General Lee used in retreating after the battle of Gettysburg. Still proceeding in an easterly direction, Jack's mountain, a spur of the general system, is crossed, and Gettysburg reached. This will, of course, be exceedingly interesting, and perhaps more so when it is considered that the road taken toward Chambersburg, crossing the mountains north of Cashtown, is the same one which General Lee took in approaching the crucial encounter with Meade. As a contrast to mountain climbing, the run up the Cumberland valley will be a particularly pleasing one, as it always is to autoists who have just come across the Alleghanies.

At Harrisburg the turn to the East is made, via Reading, over Mount Neversink, and through Birdsboro and Pottstown, to the finish at Norristown. The distance on the first day is 190 miles, and on the second 210, so that even though going through a picturesque and interesting country, the event is not without its qualifications as a competition and an endurance tournament. Already a large number of entries have been assured of the Philadelphia automobile trade. The Oldsmobile "six" with its 42-inch wheels, and the American Traveller with 40-inch wheels will be among the contestants.



Route of Second Annual Endurance Run of Norristown (Pa.) Automobile Club.

## NEW YORK PREPARES FOR WEEK OF FESTIVITIES

**E**NTHUSIASM for the second annual carnival of the New York Automobile Trade Association has been bubbling forth from the concerns in the automobile business of the metropolis during the present week, in preparation for the festivities of the next. Banners, bunting, and other decorative ornaments have begun to appear on the buildings along and just off of Broadway, while the interiors have been appropriately arranged for the celebration of the opening of the spring touring and selling season. A hill climb, a series of speed trials, an efficiency contest, a demonstration of the feasibility of automobiles in conveying troops, and a mammoth parade are the features in which the automobiles will be the centers of interest. A dinner dance and a smoker will furnish evening social entertainment and a souvenir day will supply some surprise in novelties which will be given to customers and friends of the dealers. So successful was the carnival last year that this one has been anticipated and some elaborate preliminary work done for it.

Opening on next Monday, there will be a hill climb on the Fort George hill which, in point of entries assured, will surpass any yet held. Price classification by the A. A. A. standard has been adopted, and there will be eleven events, seven for gasoline cars only, one for steam and one for electric cars only, and 'free-for-all'. Entry blanks for these have been issued.

Tuesday straightaway speed trials on Hillside avenue, Jamaica, L. I., will be run, over the same course used in races last Spring.

Souvenir day will hold the attention on Wednesday, with a dinner dance in the evening at the Hotel Marseille.

Inability to get a track in good condition has prevented the original plan of a track race and games for Thursday, and instead it has been decided to call this "Military" day. The remarkable demonstration held recently in England of the manner in which soldiers can be quickly mobilized and transported some distance will be duplicated here, four or five hundred members of the ninth regiment of the militia, fully equipped for service, being the soldiers in the case. They will be picked up at their armory and carried to some suburban place for luncheon, and brought back late in the afternoon.

One of the most interesting events announced will be the feature of Friday, that of a one gallon efficiency contest, planned on much the same lines as the one held several years ago. The contestants will not know the route to be taken until just before the start; they will be given a single gallon of gasoline, and will run as far as possible, using special tanks if desired, in order to get every drop of gasoline before stopping. To put all upon an equal basis regarding size and power, it has been decided that the score of the cars shall be obtained by multiplying the distance traveled by the weight of the car and its occupants. The price classification will also be in effect and there will be an observer on each car. Distance will be measured by odometers, unless a specially measured suburban course can be obtained.

Decorative effects may be given full reign in the carnival parade, an event in which hundreds of automobiles are expected to take part, held this year in the afternoon instead of the evening. There will be sections for beautifully bedecked cars, for grotesquely finished ones, for commercial cars, floats, and for regularly equipped cars, so that all kinds, types, and sizes may take part. Generous prizes, both cash and plate, have been announced for all the competitive events of the week. Manufacturers, dealers and branch managers have entered heartily into the spirit of the affair, and the size of the parade may be surmised from the fact that the Maxwell Company alone has made arrangements for 150 cars; another concern that had previously entered 30 raised this to 50, and others are expecting to do likewise. Added to the trade division will be the great number of private owners who have made extensive preparations.

The following is the list of events scheduled:

**Monday, April 26.**—Fort George hill climb. Eleven events.

**Tuesday, April 27.**—Straightaway speed trials, Hillside avenue, Jamaica, L. I.

**Wednesday, April 28.**—Souvenir day on Automobile Row. Dinner dance at Hotel Marseille, Broadway and One Hundred and Third street.

**Thursday, April 29.**—Military day.

**Friday, April 30.**—One gallon efficiency contest.

**Saturday, May 1.**—Carnival parade. Smoker, and award of prizes at Automobile Club of America.

## INTERESTING STATISTICS OF THE MAXWELL NON-STOP RUN

**B**OSTON, April 19.—Complete data, showing the effect of the 10,000-mile non-stop motor run, have not yet been compiled by the technical committee, in whose charge the Maxwell car was placed at the finish of the test last Monday afternoon. The car is now in the laboratory of Professor Charles F. Park, of the Institute of Technology, and his examination is so minute that he has not yet completed it. When the report of Professor Park is drafted, it is expected that figures will be given showing just what was the result on every part of the mechanism of more than twenty-five days' continuous running of the motor, and the journey of 10,074 miles, which is what the register showed when the car was finally stopped by President Speare, of the A. A. A.

From the log-book carried on the car during the test, however, some interesting facts have been compiled. In this book was entered a complete account of the car's performance, the mileage per day and per trip, the amount of supplies taken on, and the repairs that were necessary. The motor was run exactly 606 hours and 21 minutes, never stopping from the time it was cranked at 10 o'clock on the morning of March 18, until it stopped in Copley Square at 4:21 o'clock April 12. During that period there were used, according to the log-book figures, 758 gallons of gasoline, making the average mileage per gallon about 13.3. This, however, included time when the car was standing still, but the motor was eating up fuel. There were used 119

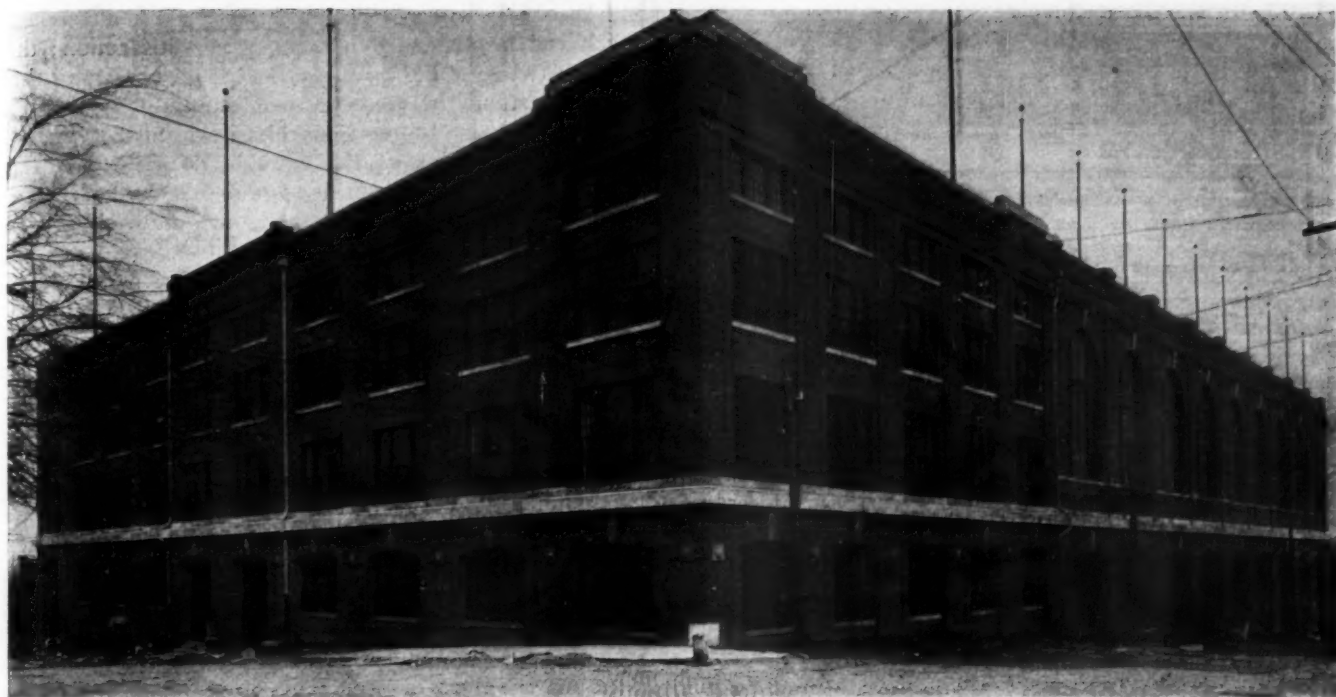
gallons of oil and 17 pounds of grease for lubricating purposes. The consumption of oil was much greater than on an ordinary touring car, because a very light oil was used in large quantities.

In the total duration of the test, 606 hours and 21 minutes, the car itself was standing still with the motor running 39 hours and 40 minutes. In that time the car would have covered, had it been in motion, approximately 600 miles. The time during which the car stood still was consumed in taking on gasoline and oil, changing drivers and observers, changing tires and making repairs. There were eight tire punctures, the rear axle was changed, a spark plug and a push rod replaced. Several spring leaves had to be replaced. In all the car made 156 round trips from Boston to Worcester, Providence, Newburyport, Nashua, Marlboro and Framingham, making an average of 65 miles per trip.

Members of the technical committee, who are the only persons that have ridden in the car since the end of the test, were surprised at the smooth manner in which the motor was running.

**Splitdorf Gives Dinner to Maxwell Drivers.**—In recognition of the good work of the drivers who handled the Maxwell car in its 10,000-mile test, Charles F. Splitdorf, maker of the Splitdorf magneto and coil, with which the Maxwell was equipped, on Tuesday evening gave a dinner to the drivers and the members of the Maxwell Company at the Hotel Thorndike. Through the run the Splitdorf magneto gave the best of service.





Atlanta's Big Auditorium, Nearing Completion, Where "National Automobile Show of the South" Will Be Held in November Next.

### CANDIDATES FOR WESTERN CUP RACES.

CHICAGO, April 20.—Frank H. Trego, general executive in charge of the two races of the Chicago Automobile Club—light car event, June 18, and Cobe cup, June 19—started out Monday night on a canvassing trip to Western factories for the purpose of getting a correct line on the probable entries for the two big Western road races. He has mapped out a circuit, taking in Flint, Pontiac, Jackson, Detroit, Indianapolis, and Cleveland.

The first stop at Pontiac resulted in the positive assurance that the Buick will have three cars in both events, with Strang, Burman, and Chevrolet as drivers. A visit to the Oakland factory at Pontiac unearthed a possible condidate which hitherto had not been figured upon for the Cobe cup.

While Trego has been away home folks have been busy, and yesterday it was announced as almost certain that a Renault will compete in the light car event, with the driver probably George Schoeneck. Another candidate for the light car race which had been overlooked by the census takers is the Corbin, and the Bird-Sykes Company has opened negotiations with the factory with a view to making an entry. Louis Geyler, Stevens-Duryea agent, also announced yesterday that his company is likely to nominate one of the four-cylinder models.

### ANOTHER TAXICAB COMPANY LAUNCHED.

New York wisely has the taxicab habit beyond all hope of recovery. The latest applicant for a share of the public favor is the W. C. P. Taxicab Company, which has been organized by C. F. Wyckoff and E. S. Partridge, of Church, Wyckoff & Partridge; and A. R. Rockwell, F. E. Moscovics and De Witt Page, of the Bristol Engineering Company, Bristol, Conn. The vehicles of the new company will be popularly known as the "yellow taxi," from their coloring; the chassis and lower portion of the body is painted orange yellow, striped with black, and the hood and upper part of the body black.

The cabs, which are to be built by the Bristol Engineering Company, will embody several new features. The driver will sit on the left-hand side, with the levers in the middle. The taximeters will be driven from the front wheels, so that their measurements may be as accurate as possible, especially in slippery weather. The first "yellow taxis" are already on the streets. They will be operated from the garage of Wyckoff, Church & Partridge, at 232 West Fifty-sixth street.

### ACCESSORY CONCERNS FORM COMBINE.

Announcement was made Tuesday of a selling plan involving five of the best known concerns in the trade, to be backed and managed by men who have been eminently successful in the marketing of accessories during the past few years.

The new corporation, with a capital of \$100,000, will be known as the United Manufacturers. It will act as a co-operative selling and distributing organization, handling the business of the Jones Speedometer, Inc., Weed Chain Tire Grip Co., C. A. Mezger, Inc., Connecticut Telephone & Electric Co., and N. Y. & N. J. Lubricant Co.

Jones speedometers, Weed chains, Soot-Proof spark plugs, Automatic windshields, Connecticut coils, and Non-fluid oils are the products that will be handled.

The organization will be owned and personally managed by the individual manufacturers who compose it. Plans at present include New York headquarters at Broadway and Seventy-sixth street, and branches in Detroit, Boston, Chicago, and Cleveland, with other branches to be opened later.

The president of the new organization will be W. B. Lasher, of the Weed Chain Tire Grip Co., while the other officers are R. M. Owen of C. A. Mezger, Inc., vice-president; Robert H. Montgomery, New York, secretary; George L. Holmes, of Jones Speedometer, Inc., treasurer.

As might be expected, the objects of the new organization are to concentrate the selling efforts of the interested companies and to reduce the expense of selling and distributing. On account of the branch house system, it will bring the selling company in closer touch with its customers. The new corporation will do no retail business, concerning itself solely with the jobber and dealer.

### AUTOISTS USE THE WIRELESS "C. Q. D."

Two Newark, N. J., automobilists, Will H. Linkroum and A. Frederick Collins, have perfected a wireless telephone which can be carried in a suit case. One day last week they took the apparatus with them in Linkroum's Lozier car, and Collins, the inventor, held wireless conversations with the Newark office, one being from the Morristown Pike road, twenty miles away. Mr. Linkroum believes that the wireless 'phone will be of great assistance to automobilists in obtaining help in case of accident. The only difficulty is the necessity of having the garages previously equipped with similar instruments.



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### FOR THE MAN BUYING HIS FIRST CAR.

As the first days of warm weather appear and the roads begin to dry into passable condition, it is customary to give forth a word of advice and exhortation to those about to make their first plunge into automobilism. Never before have the cars been so good or so cheap; never before have there been so many profits and pleasures to be realized from their use—does this sound familiar? Yet, even at the risk of bromidism, we must repeat it. Perhaps some new reasons can be brought out to show that this, above all others, is the year; so that the stragglers, as of old, will fall into line and dim longings will be aroused in minds heretofore unmoved by the demonstrator and his seductive efforts.

Those to whom this preachment is especially addressed we may divide into two classes: the doubtful, who are not persuaded of the advantages of being an automobilist, and the timid, who, although persuaded, must count the cost. The former we can only advise to secure as many rides, runs, and demonstrations as possible; for their hesitation can only come through lack of experience. So let them pester the expectant agent and the complaisant friend; may these long-suffering teachers be rewarded hereafter, if not on this mundane sphere.

To the timid, fortunately, we can give facts and figures. This year for the first time the possibilities of the light, low-priced car are beginning to be realized. At \$1,500

and less there are a dozen different makes, any one of which can be depended upon to give satisfaction; they will run twenty miles on the gallon of gasoline, and their tires will stand the wear of five thousand miles. The useful life of one of these machines can only be guessed at. There are cars of the vintages of 1904 and 1905 which will be in active service again this Summer, albeit a trifle antiquated in appearance; and allowing for the improvements in construction since those days, these new cars should last nearer ten than five years. As for the chauffeur, the light car knows him not; the owner drives, and doubles his enjoyment thereby.

So snap the whip once more, and round the stragglers into line; delivery dates are going fast, and now is the time to buy!

\* \* \*

### LAW MAKING IS IMPROVING.

Common sense treatment of the automobile is evident as one State legislature after another concludes its annual session. Pennsylvania has improved its law in many ways, and it will now welcome the automobilists of other States, providing the other States similarly welcome the autoists from the Keystone commonwealth. New Jersey has also become quite liberal, though its reluctant politicians would insist upon a measly dollar fee for visitors. New York now has in mind the abolishing of all automobile speed limits and the making of drivers responsible under the same law which covers other users of the road. The fee is to be an annual one, as in many other States, but the abolishment of the miles-per-hour iniquity and consequent "trapping" will be considered by most automobilists as a good trade under the circumstances. Other legislatures are still busy, but the grist that has already come from the law-making mill is indicative of the changed attitude of public and politicians generally. Connecticut still bears the palm for the most liberal and sensible treatment of motor-driven vehicles, and this despite the fact that its legislature is composed in great part of farmers and men from small towns. And the "Nutmeg State" has roads worthy of the name.

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### "WE SHOULD WAIT AND WATCH."

Here is some editorial comment from the New York Times which supplies material worthy of fair-minded consideration by the man who has yet to become an automobilist in one form or another:

Automobile accidents are undoubtedly numerous, and too numerous, but it is doubtful if their number increases in anything like the same proportion as does the number of automobiles, and it would be only fair, in making up the account, to cross off a good many of them as only taking the place of accidents which, if it were not for the new vehicles, would be happening to users of the vehicles they replace.

Another thing to remember is that for innumerable centuries humanity has been learning how to keep out of the way of horses and the carriages they draw, while its experience with automobiles began less than twenty years ago, and evasion of them has not yet become instinctive and automatic. All of us can remember when "the murderous trolley car" claimed its daily victims, and motorists were the constant objects of just such denunciation as the chauffeurs are now receiving. The cars are run to-day much as they always were—only faster—but, considering their enormous number, they do little harm.

Of course, there is in all this no excuse for the doings of reckless, drunken, or incompetent chauffeurs, and the problem of their proper control or abolition must be studied till a solution of it is reached, but there is some reason for viewing the situation as it is. We may be happy yet, even with the automobiles steadily increasing in numbers daily.



## NEW YORK TO PAY ANNUALLY AND ABOLISH SPEED LIMITS

ALBANY, N. Y., April 19.—As the result of the conference held between legislators and representatives of the automobilists, an agreement last week was reached on the provision of a new motor vehicle law, which was quickly introduced in the form of an amendment to the State highway law. The measure is now in the hands of the Finance Committee of the Senate.

The agreement included the taking of the Allds-Hamn bill of last year; which was reintroduced early this session, and the making over of it where it did not coincide with the plan and scope of the conference.

**Horsepower to Be the Basis.**—By the proposed new law horsepower is to be the basis of the registration fee whereby automobile owners are to pay their share toward the repair and maintenance of the highways of the State.

The provision settled upon was that of the uniform laws commission of last Summer, with a slight increase over its rates. It is provided in the new bill that each owner shall pay an annual fee to the Secretary of State of \$4 for each car he owns of 20-horsepower or less; \$6 for each car of between 20 and 30-horsepower, and \$10 for all machines of over 30-horsepower. This is expected to raise an annual revenue of over half a million, which shall be turned over to the State treasury to be used for the repair and maintenance of highways.

**All Speed Limit Laws Are to Be Repealed.**—There will be no speed prescribed as lawful, and therefore there will be no auto-traps and no graft for the country or other justices. The motor vehicle driver will be placed on the same equality with the driver of a horse-drawn vehicle in that neither may drive recklessly so as to endanger life and property at any rate of speed. This will make it possible to **arrest a reckless driver on a congested street** who may be driving at a speed of not more than five miles an hour and yet may be endangering the lives of pedestrians. The same vehicle may be driven 20 miles an hour early in the morning without endangering anyone.

The penalties prescribed are a fine of \$50 for the first offense; a fine of \$50 or thirty days' imprisonment for the second offense; and a fine of \$50 and thirty days or possibly six months' imprisonment for the third offense, and a clause for the suspension of the driver who thrice offends may be put in.

These penalty clauses may be worked out somewhat differently before the bill is passed.

Professional chauffeurs are to pay \$10 for their first license and \$5 a year for its renewal; the Secretary of State shall furnish an official badge, the design and color of which he shall determine, and the color shall change each year.

The common rules of the road, which seem to have been left out of the highway law, will be reinserted to cover all vehicles using the highways, and fixing by statute that vehicles meeting shall turn to the right and shall pass to the left, etc.

Among those present at the conference were: Senators Allds and Heacock and Assemblyman Hamn; H. A. Meldrum, president of the New York State Automobile Association, and Oliver A. Quayle, chairman of its legislative committee; Superintendent of Insurance William H. Hotchkiss, ex-president of the A. A. A.; F. H. Elliott, secretary of the A. A. A.; Charles T. Terry, representing the National Association of Automobile Manufacturers; Alfred Ely, representing the Automobile Club of America; Giles Stillwell, of Syracuse, and several others.

The wording of the new law, which is to obviate the present speed limit provision is this:

Every person operating a motor vehicle on the public highways of this State shall drive the same in a careful manner and at a rate of speed so as not to endanger the life or limb or property of any person.

The anti-joy ride and anti-tampering provision is as follows:

Any person using or operating, driving, injuring, or tampering with a motor vehicle without the permission of the owner is punishable by a fine of not exceeding \$100, or imprisonment of not more than six months, or the suspension of the right to operate a motor vehicle as a registered chauffeur for not more than six months, or all of such penalties.

Automobiles used solely for commercial purposes, or which are propelled by electric battery power, or are used or to be used solely within the confines of a city, are to pay only a nominal license fee of \$2, without regard to their horsepower, as they would not use the good roads.

The registration fees imposed shall be in lieu of all of the taxes, general or local, to which motor vehicles might be subject as personal property.

## PENNSYLVANIA, LAW IMPROVED, GRANTS RECIPROCITY

HARRISBURG, PA., April 19.—Reciprocity for automobilists from other States; an increased speed limit; uniform speed and license regulations; a new rate of fees; and the provision that all fines shall be reported to the State Treasurer, are the subjects which have been accorded special treatment in the Keystone State's new automobile law. These features are embodied in the Townsend Senate bill, which after an intermingling with the Grim House bill, has finally passed the Legislature and but awaits the signature of the State's autoing executive, Governor Stuart, to make it a law in immediate effect. The Pennsylvania Motor Federation figured much in the passage of the measure.

Broad-minded in its provisions, and superseding other statutes with which general fault has been found, the enactment is a pleasing one to automobilists, representing the result of a great deal of hard labor against a few legislators who would have had narrow policies enforced. Of premier importance is the clause which allows tourists from other commonwealths to enter the borders of this one without having to make extensive arrangements for being licensed beforehand. A limit of ten days is set, however, during which the license tags of States which similarly recognize those of Pennsylvania, will permit the use of the roads. There is no statement in the law preventing a visitor from be-

ing within the State for more than one period during a year.

The licensing of resident cars and owners will hereafter be carried out along different lines from those now in effect. A fee of \$5 is required for cars of less than 20-horsepower; \$10 for those of more than 20 and less than 50; and \$15 for those of 50-horsepower or more. Motorcyclists are required to pay \$2, but do not have to carry tags.

Dealers and manufacturers will be allowed to have five sets of licenses and tags, and each set will be sold for \$5. In addition, the operators of these company cars must be licensed, at \$2 each, and must wear badges.

Uniformity was a prime requisite asked by automobilists, and their desires have been heeded, in at least two particulars: that the State law should be the only one, that municipalities should not be allowed to issue city licenses, and that all such regulations in effect now shall be declared void. This was mainly a hit at the Quaker City, which has required operators to take out local licenses. The other consideration is that of speed, for by the new law 24 miles per hour is set as the maximum legal limit, with 15 as that required in built-up sections of towns and cities. The only qualifications placed upon this are those of recklessness, and that when approaching a street car which has stopped to dis-

charge passengers, the automobilists **must stop or not endeavor to pass on the side from which persons are alighting.** The speed law cannot be altered by localities, except in the case of public parks, which may restrict the speed, but not to a lower degree than that of other vehicles.

In the matter of fines there was a determined effort on the part of automobile owners, through the clubs, to have some regulations which would stop the petty graft known to have been carried on by a number of township officials, justices and constables. Opinions were divided as to whether the fines should be turned into the State treasury, to be used in road construction, along with the license fees, or whether they should be allowed to remain in the townships, but with requirements as to reports which would prevent misappropriation. It was finally decided that the fines for speeding shall be used by the townships authorities, but the collectors who receive these fees are now required to give a sworn detailed statement quarterly. All penalties imposed for other acts than fast traveling must be sent at once to the general State fund.

Prevalence of **joy-riding and flagrant use of cars** influenced

those who framed the act to aim directly at the atrocious custom, especially in the matter of fines, and they are now exceptionally heavy: \$100 to \$300 for the operation of a car by an intoxicated person, with the probability of a year in jail, or both, and a suspension of the license. A sum of \$100 is the cost of using a car without the knowledge of its owner, and perhaps a year.

For speeding, however, the penalties are not so large, ranging from \$10 to \$25 for a first offense; a second offense within a year may cost between \$25 and \$50, or 20 days in the county prison; and a third dereliction is rated at from \$50 to \$200, or 30 days. Jury trials may be obtained, if desired.

Constables and officers may arrest upon sight without a warrant, but must file with a magistrate an affidavit setting forth the reasons, and furnish the autoist with a copy. If a car is seen violating the provisions of the law, the license is taken as prima facie evidence that the owner is in it, and he will be held responsible unless he can show who was really the operator.

The Townsend bill will go into effect as soon as signed, except as relating to the licensing of Pennsylvania residents, who shall be governed by the present statute until December 31, 1909.

## NEW JERSEY LAW BROUGHT FAIRLY UP-TO-DATE

TRENTON, N. J., April 19.—Governor Fort today signed three of the six automobile bills passed by the legislature, and announced that he will sign the remaining three on Wednesday. Automobilists all over the State are elated at their success in obtaining the passage of these measures, which at least eliminate all the medieval features of the former statutes and in some respects are an advance upon those of some other States. Complete **reciprocity in the licensing** of non-residents has not yet been granted, but they are permitted to remain in the State for eight consecutive days, or for four periods of two days each, **on the payment of a fee of one dollar.** Offsetting this is the provision that all vehicles must carry a light at night—a feature which automobilists have always advocated.

The three bills which are now law provide as follows: First, that it be a misdemeanor to drive an automobile without the consent of the owner, or while in an intoxicated condition, or for a bet or wager, or to break a record, or after license has been revoked, or to fail to display a registration number or to display a false registration number; second, that the funds already collected from licenses, registration fees, and fines, amounting to about \$300,000, be released for immediate **use in road repairing**; third, that the Commissioner of Roads be given two competent engineers as assistants.

Of the measures which will be signed Wednesday, the first is that providing for the **lighting of all vehicles at night**, on penalty of a fine of one dollar for each offense. Non-residents are permitted to use their machines in the State for a limited time,

as explained above; the licenses may be obtained on written application, inclosing the fee of one dollar, and in case the applicant is properly registered in his **home state**, he need not take out a driver's license in New Jersey. The last and, at least to the native automobilists, the most important bill does away with the absurd requirement of numbers on the front lamps, fixes **twenty-five miles an hour** as the maximum speed limit in open country where the houses are more than 100 feet apart, and reduces the fees allowed justices of the peace, constables, and witnesses to such a low figure that there will no longer be any incentive to make wholesale arrests.

The passage of these bills is an example of the power which can be wielded by a firm organization of clubs. The automobilists carried on their campaign in a businesslike way, obtaining the aid of boards of trade and other influential associations all over the State. Much credit is due Joseph H. Wood, chairman of the legislative committee of the Associated Automobile Clubs of New Jersey, for his constant and fruitful activity. As a result of their efforts the automobilists have obtained a reasonable and consistent law, which grants freedom from petty annoyances in the guise of "Jersey justice," and which will no longer drive away their visitors.

In the past New Jersey's reputation has kept away thousands of tourists who otherwise would have spent weeks at the beaches and summer hotels. The greater prosperity of these resorts should serve as an example to other States of the advantages of an equitable automobile law.

## CONNECTICUT TO HAVE COMMISSIONER OF MOTOR VEHICLES

HARTFORD, CONN., April 19.—The automobile bill drawn up by the committee on roads, rivers and bridges, as well as the bill providing for the establishment of the office of commissioner of motor vehicles, was reported to the Senate and is due to be taken from the table this week. The commissioner of motor vehicles measure is not regarded with any great enthusiasm by the automobilists of the State, but they believe that if it is rejected they may expect the enactment of a law giving justices' courts the power of revocation of licenses. That, of course, would mean chaos, and the former bill seems the lesser of the two evils. It is possible to secure a fair-minded commissioner who will be reasonable in the execution of the automobile laws, whereas if the rural courts should have the power to keep

an owner from using the roads, because of the revocation of the license, this State will not be the most pleasant one for automobilists. The hotel men have joined the auto people in the demand for proper consideration of tourists.

The chief objection to the bill drawn up by the committee on roads, rivers, and bridges is the provision calling for a speed of ten miles per hour at intersecting streets. It is pointed out that this would give the country constables a fine opportunity to re-establish their speed traps, which have been decidedly in the background under the present law. Considerable opposition in both houses is expected from the representatives of the rural districts, as there is still much feeling against out-of-State automobilists who habitually drive at express-train speed.



### PITTSBURGH GAINS SOME NEW FACTORIES.

PITTSBURGH, April 20.—Greater Pittsburgh is soon to get three automobile manufacturing plants, if present prospects count for anything. This city has turned out to be one of the best automobile buying centers in the country, and this has encouraged manufacturers to seek locations near Pittsburgh for their new plants. The new plants which will be located in this district are those of the Belden Motor Car Company, the Perfection Magneto & Commonsense Auto Company, and a new concern headed by C. P. Munch, general manager of the Buffalo & Susquehanna Coal Company, of DuBois.

The Belden Company has been located in this city for several years, with offices in the Bessemer building. Its new car, the invention of Edward H. Belden, elicited much comment at the recent local show. The company has practically decided to locate the plant at Ambridge, the new industrial town, 30 miles down the Ohio river, where the great plants of the American Bridge Company were located five years ago. The plant for which plans are now being prepared will employ at least 2,000 hands, and definite announcements regarding it will be made within the next 60 days.

The Perfection Magneto and Commonsense Automobile Company last week bought the property of the Ambridge Lumber Company, also at Ambridge, and will move its factory there from Anderson, Ind. Just as soon as improvements are made to the plant the company will start work with 50 men to manufacture specially designed automobiles and magnetos. The company later expects to employ 150 men. F. C. Borden, president of the company, has been in the Pittsburgh district for several weeks negotiating for a site. He is also secretary of the Sanitary Manufacturing Company, of Salem, Ohio, and the Pittsburgh manager of the Russell Engine Company, which has a capital of \$1,500,000. T. K. Bevington will be general manager of the Commonsense Company.

C. P. Munch is promoting the third concern which proposes to manufacture automobiles in this district, and it will complete its organization probably this week. The company will have ample capital. The car which it will manufacture will be known as the "Pennsylvania No. Six." It has been manufactured hitherto at Massillon, O., by the W. S. Reed Co., and was there known as the "Massillon Six." Orders for 30 cars have been placed with the Howard Motor Company, of Yonkers, which will manufacture the new machine until a plant can be erected. W. S. Howard is identified with the new company. The "Pennsylvania No. Six" will sell for \$2,250, and the plant proposed will employ at least 500 men.

"Pittsburg Six."—For more than a year another car has been manufactured very successfully at New Kensington, Pa., twenty miles up the Allegheny river. This has been known as the "Pittsburgh Six," and is a good seller in this district. Commercial vehicles have also been manufactured in Pittsburgh on a small scale, and it is possible that a plant may be built soon.

### A. C. A. HAS TALK ON TIRES.

NEW YORK, April 20.—Demountable rims and other improvements in tire construction and application were thoroughly discussed this evening before members of the Automobile Club of America. Representatives of several large manufacturers explained the merits of their particular goods, with opportunities given for the deflation of their arguments. The new demountable rims were given the most time, for there were several shown and demonstrated which have but recently been exploited. Those who spoke were: P. W. Litchfield, superintendent of the Goodyear Tire & Rubber Company; Alexander Dow, Dow rims; F. G. Hill, Republic; J. B. Cothran, Continental; Orrel A. Parker, Newmastic; C. B. Whittelsey, Hartford Rubber Works factory; Marcus Allen, Empire; Dr. Doolittle, Doolittle rims; and A. Harris, Kempshall. Previous to the tire talk the Snell method of storing and supplying gasoline to garages was explained, illustrated with a working model. About 200 club members and friends attended.

### TOLEDO SALE AND POPE COMPANY PLANS.

HARTFORD, CONN., April 19.—In the event of the sale of the Toledo plant of the Pope Manufacturing Company, it is the intention to retire the issue of \$266,000 of the six per cent. notes due August 1, 1910, and by appropriation of about \$50,000 from the current earnings the company will be able to take up the issue of \$267,000 which matures August 1, 1909. Such action would leave earnings of about \$350,000 applicable to the two classes of stock in the event of the consummation of the sale of the Toledo plant to the Overland company, which is now regarded in this section as a foregone conclusion. It is assumed that through the reorganization of the Pope Company, the operation of the two plants at Hartford and Westfield would net an annual income of about \$400,000. With these earnings the company could pay 6 per cent. on the \$2,500,000 of preferred stock, and then have a remainder of \$250,000 for the \$4,000,000 of common stock. Whether these sums will be distributed will depend on the financial situation and the policy adopted by the board regarding the accumulation of a surplus and a working capital. It is expected here that the sale to the Overland interests will net the Pope Company about \$500,000.

### TRANS-PENNSYLVANIA ROAD ASSURED.

HARRISBURG, PA., April 19.—Pennsylvania will have a trans-State highway, from Philadelphia to the Ohio State line, including Harrisburg en route. Such has been provided for in the highway bill which was passed last week just as the Legislature was about to adjourn, and which had a stormy voyage between the two houses before it was adopted. The movement was started toward finality by Governor Stuart, who has fostered the matter since it was first suggested, even to touring over proposed routes, and the dream of a fine road across the commonwealth will probably be realized before long.

Within six weeks, funds aggregating \$3,000,000 will be available for the commencement of the undertaking, to be spread over two years from May 31, with an additional million in each of the two following years, the entire sum set aside being \$5,000,000.

### SELDEN FACTORY NOT DAMAGED BY FIRE.

ROCHESTER, N. Y., April 19.—Since the recent disastrous fire in this city the Selden Motor Vehicle Company has been busily engaged denying reports that its factory was destroyed. The factory which was burned was one built by Judge H. R. Selden, the father of George B. Selden, president of the present company, and was sold to the Palmer Company. The conflagration did not injure the plant of the Selden Company, and the Selden cars are being produced as regularly as before.

### NORTH JERSEY AUTOISTS HAVE ELECTION.

PATERSON, N. J., April 19.—The annual meeting of the North Jersey Automobile Club resulted as follows: President, W. G. Norwood; vice-president, J. N. Faulkner, M.D.; second vice-president, B. Eastwood; secretary and treasurer, James Madden; captain, Harry McGinley; first lieutenant, Charles Frost; second lieutenant, W. M. Jacobus; counsel, Jacob Vanderclock. George A. Post, who has been a most conscientious president for several years, declined a continuance in office.

### PETREL WILL MOVE TO MILWAUKEE.

KENOSHA, WIS., April 19.—The Petrel Motor Car Company, of this city, has secured a new factory at 470-480 Virginia street, Milwaukee, where it will be enabled to multiply its present output four or five times. The removal will take place May 1.

### GILLETTE TO REPRESENT CONTEST BOARD.

HARTFORD, CONN., April 19.—C. H. Gillette has been appointed official representative of the contest board of the A. A. A. and will have entire control of all automobile contests in this locality.



New Headquarters of Herz & Company, New York City.

### THE AMERICAN HOUSE OF HERZ.

Coincident with the enormous increase in the business of automobile manufacturers there has been a parallel one for the makers of automobile parts and supplies, necessitating enlarged facilities for production, a maximum output of high-grade goods and often a change of headquarters. This has been the recent experience of Herz & Company, of New York, Vienna and Stuttgart, which has moved northward along Lafayette street, in New York, to the corner of Houston, where it has found factory space for the extension of its trade. Under the direction of G. L. Herz, who spends half of each year in this country and half in Europe, the new plant is now working day and night to fill its orders for ignition and other specialties, all but a small part of which are used by automobile factories.

The New York factory is used in making timers, distributors, air pumps, spark plugs and shock-absorbers. The Herz magnetos are all made in Germany and imported complete for American use. Wire cables and copper gaskets are also products of the Herz European plants, the reason for this, according to Mr. Herz, being that the more skilful workmen do not leave their home towns and cannot be induced to go away to other countries. Much of the manufacture of these devices requires handwork. At the same time much of the material, such as compressed fiber and rubber, can be secured of higher quality abroad.

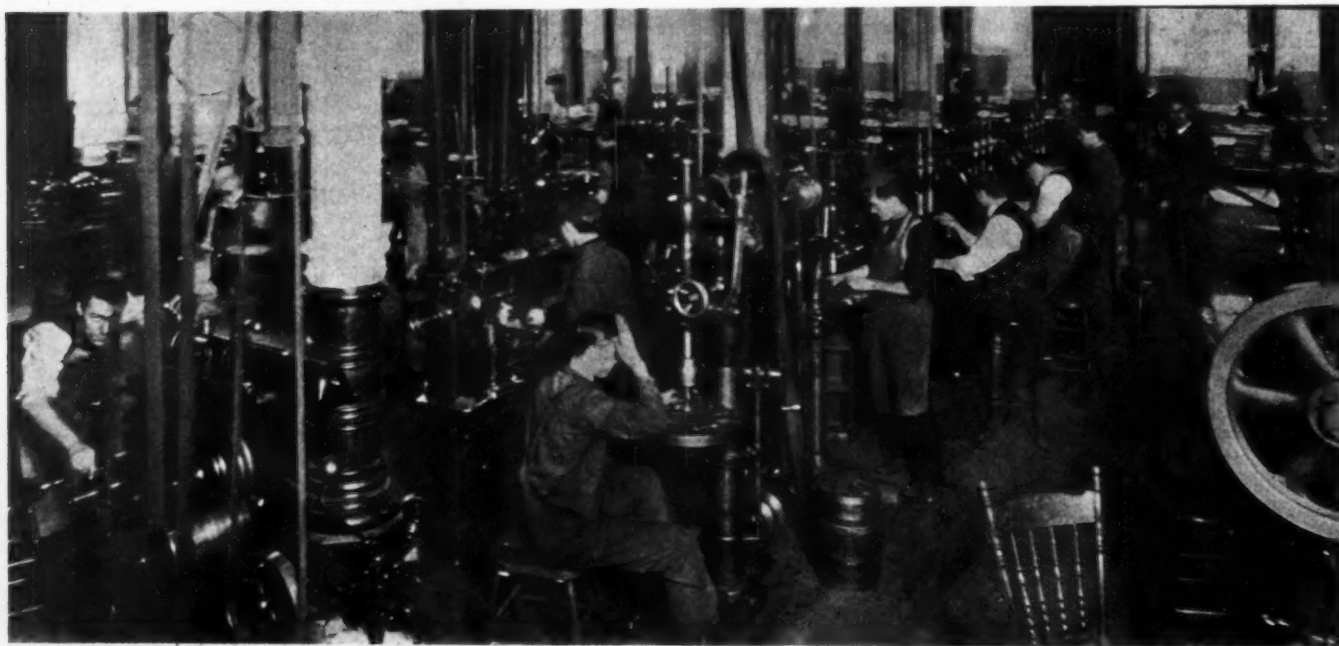
By its change in location the metropolitan house is now fully equipped to manufacture the parts which the firm markets; 30 machine tools, many of them special in design and construction to meet the needs, operated by experienced workmen, are in con-

stant use. Castings for the pumps are machined; platinum alloy electrodes for spark plugs are stamped from ribbons of the expensive material; timer cams, ball races and contacts are hardened, and many of the lines are assembled under the direction of the head of the firm. One of the feature machines of the shop is that which grinds the interior of the roller-contact timers.

Six different styles of magnetos are now built by the Herz company and imported into this country. One which is receiving the attention of the makers at present is a light one for aerial ignition, where high-speed work is necessary and high efficiency required. This is one of the lightest devices of its kind ever made, and it gives a very hot spark at low speeds, such as when the armature is revolved by the fingers, being then of such intensity as to jump an eighth-of-an-inch gap. The growth of the motorcycle business in America can be appreciated from the fact that over 4,500 Herz magnetos for this type of machine have been received during the past fiscal year. Of the 12 types of timers made, two have just been put upon the market, of special design and embodying improved features, such as tool-steel contacts, ball bearings, fiber insulation and absolute rigidity. These devices are made in the New York factory, as are also the air pumps, which are used for pumping tires, blowing whistles on motor boats, or for securing air pressure for other uses. A feature of the Herz pumps is that there is no leather about them, the gray iron pistons having two rings of the same material. They are friction driven.

Bougie Mercedes plugs, with double stone insulation, are claimed to be self-cleaning and not open to short-circuiting or fouling. The electrode has six points, instead of one, set eccentrically so that the spark-gaps vary from 1-4 to 1-2 of a millimeter, the idea being to take advantage of the varying intensity of the magneto spark as the speed of the engine changes. These changes are accommodated in the plug. The cleaning property is secured by the construction, which allows the gas compressed in the plug chamber to blow out around the electrode, blowing any oil or carbon deposits away from the electrode.

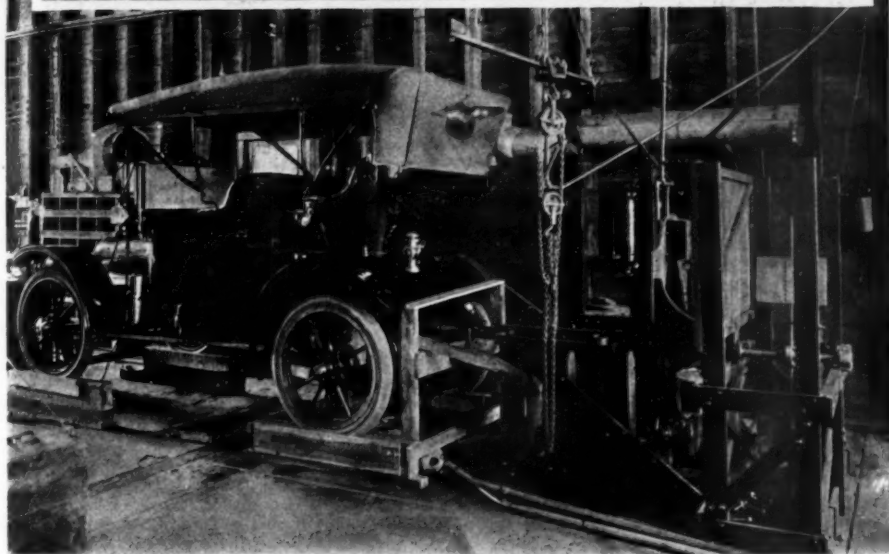
The business of the accessory manufacturers is a good barometer of conditions of the general automobile business, and of this Mr. Herz says: "The factory business must be enormous, as indicated by the pressure brought to bear upon us for faster delivery of our products. Our orders on file would require us to double our capacity, and we have had to take on night work. The trade this year is utterly beyond comparison with that of a year ago. Then it was not good. I will go to Germany very shortly to hurry affairs there and try to get more material."



One of the Work Rooms in the New York Plant Where the Herz Specialties are Made.



## News in General



Testing Horsepower of Franklin Engine in Completed Car.

In testing the horsepower of engines at the Franklin factory, Syracuse, N. Y., the engine shaft of the car is connected with a fan dynamometer, by which any desired load can be put on. The revolutions per minute, gasoline and oil consumption, and the horsepower are noted. Ordinarily only the engine is tested, but the testing room is so arranged that a completed car can be admitted, the engine shaft extended out through the rear of the running gear, and complete readings made with the dynamometer.

**Rambler Fined for Beating Interurban Car.**—An unusual result came of a fast brush between a Rambler touring car and a limited express interurban car on the Louisville and Eastern Railroad, according to Prince Wells, the Louisville, Ky., representative of the Rambler cars. It seems that W. W. Liter of that city, was driving his model 45 Rambler touring car on the Shelbyville pike, which is parallel with the electric railroad, and in a four or five mile race with the fast trolley car, beat it to a crossing on the main pike, the speedometer showing 60 miles an hour. The vanquished motorman and conductor deliberately went into court, and testified against the automobilist, causing him to be fined for fast driving. The judge fined Mr. Liter 1 cent and costs.

**Another Pierce for the White House.**—A second Pierce-Arrow car for the use of President Taft and his family has been shipped by the Pierce-Arrow Motor Company, of Buffalo, to Washington. The new car is a six-cylinder, 36-horsepower landaulet, and is upholstered in gray whipcord, with the national coat of arms emblazoned upon the door panels. The first Pierce purchased was ordered last February, and is a six-cylinder suburban of 48-horsepower. An extra touring body for this car has been ordered, so that the new landaulet will be used in inclement weather in the summer and fall. All of the bodies are painted a dark blue, with a russet stripe following the lines of the moulding.

**The "Diamond" Girl.**—The latest and by far the prettiest girl to make her appearance is the "Diamond" girl. This is a large poster sent out by the Diamond Rubber Company and shows a young lady in clown's attire apparently having a fine time at a masked ball. It seems to be unmasking time, for she holds her mask in her hand. The costume of white, with longitudinal blue stripes,

contrasts well with the red background, and the effectiveness of the whole is increased by the absence of advertising matter. The only reference to the publishers is the two words, "Diamond Tires," on the buttons of the costume.

**Renault Wins New Zealand Trials.**—Paul Lacroix, manager of the Renault Freres selling branch, New York City, has received word that a 14-20-horsepower Renault car was the successful contender in the New Zealand Automobile Club's reliability trials which extended over four days. The prize was the Star trophy. There were five competitors, and the Renault and a Star of 12-horsepower furnished most of the interest. Both made perfect non-stop scores on the first three days and on the fourth the Renault lost one point and the Star five, with the result that the Renault won.

**Large Increase in Sale of Bakers.**—"1909 is unquestionably an electric year," according to F. R. White, general manager of the Baker Motor Vehicle Company, who tells of the remarkable increase in the demand for electric automobiles. Of the business in Baker cars, he says: "Our sales for the month of March showed an increase of 300 per cent, over the best month in the history of our company, and even though we have largely increased our factory force we are running day and night endeavoring to turn out cars fast enough to supply the demand for Baker Electrics."

**KisselKar Climbs Steep Texas Bluff.**—An incline of 43 per cent., the steepest bluff in the State of Texas, has been successfully negotiated by a 30-horsepower KisselKar, according to advices from Dallas. Carrying four passengers, the car twice made the climb, over a dry bed of a stream filled with crumpled lime stone, shale and ridges. After making the first climb, and reporting it, the feat was challenged, so to prove the veracity

of those interested the test was accomplished a second time. It is said that nine other cars tried the hill, but the KisselKar was the first to reach the summit.

**Spring Meeting of Mechanical Engineers.**—The American Society of Mechanical Engineers will hold its Spring meeting in Washington, D. C., May 4 to 7. Professional sessions will be held at which papers on the conveying of materials, gas power engineering, steam turbines, the specific volume of saturated steam, oil well pumping and other subjects will be considered. The members will be received by President Taft and will be given a special exhibition drill of troops by the War Department.

**College Men Plan 3,200 Mile Tour.**—Boston has been made the starting point of a 3,200-mile automobile tour through Europe, from Glasgow to Naples, by the Motor Touring Club of Syracuse University. The college men will sail on June 25, with their cars, and expect to be home by September 12, making a tour of 81 days. They calculate their expenses at about \$650 per man.

**Sells Motor Boats to Autoists.**—Among the recent arrivals in New York's automobile row is the Atlantic Company, of Amesbury, Mass., manufacturers of motor boats and engines. Under the management of R. C. R. Binder, a branch has been opened at 1619 Broadway. A temporary branch was opened last Spring and a number of boats sold to men prominent in the automobile trade.

### HAPPENINGS AT THE FACTORIES.

**Mitchell, Racine, Wis.**—Work on the new buildings for the Mitchell Motor Car Company, is rapidly progressing. The new \$80,000 office building is well under way, and the masons in charge of laying the foundations for the concrete factory additions have commenced operations. The company is contemplating the building of a circular race course on a tract recently purchased south of the city. This will give a testing ground aside from the public streets and country roads.

**Stoddard-Dayton, Dayton, O.**—Permits for the erection of a six-story concrete building have been issued to the Dayton Motor Car Company, the manufacturer of Stoddard-Dayton cars. It will be located at the corner of McDonough and Bacon streets, on the site of the present power plant. The latter will be razed, and in the meantime power will be supplied from outside sources.

**Peerless, Cleveland.**—The Peerless Motor Car Company has increased its capitalization from \$600,000 to \$3,000,000, under the laws of Ohio. It was formerly a West Virginia corporation. The incorporators were: G. B. Siddall, L. H. Kittridge, F. I. Harding, E. H. Parkhurst, John F. Demsey.

**Speedwell, Dayton, O.**—The erection of several new buildings is now being planned by the Speedwell Motor Car Company of Dayton, O. An increase of business has required enlarged manufacturing facilities.

**Union, Albany, Ind.**—The Union Auto Car Company of Albany, Ind., will shortly move to Seymour, Ind., where a new building will be used in the manufacture of touring cars and runabouts. New capital has been invested in the concern.

**Lyman, Buffalo.**—The Lyman Manufacturing Company of Buffalo, has purchased a brick factory, 46 by 150 feet

in size, which will be equipped for the manufacture of Austin-Lyman automobiles, and for general machine work.

**Frisbie, Middletown, Conn.**—The Frisbie Motor Company has filed with the Secretary of State a certificate of its action in changing its name to the Frisbie-Heft Motor Company.

**Babcock, Buffalo.**—The Babcock Electric Carriage Company has arranged for the building of an addition 40 by 100 for constructing electric automobiles.

#### IN AND ABOUT THE AGENCIES.

##### Neustadt & De Prez Form Company.

—A new selling company for the Pacific Coast has been organized by J. H. Neustadt and Eugene De Prez under the name of the Pacific Sales Corporation, with main offices at 50-56 Van Ness avenue, San Francisco, Cal., which will act as factory sales agent, covering the territory from Los Angeles, Cal., to Vancouver, B. C., west of the Rockies, and doing exclusively a wholesale business—selling manufacturers and jobbers only. Mr. Neustadt and Mr. De Prez are well known to the trade, having formerly conducted an exceedingly successful business in St. Louis, Mo.—that of the Neustadt Auto & Supply Company, and which they sold some six months ago.

##### Splitdorf Opens European Agencies.

The success of the Splitdorf ignition apparatus at the Paris show, and demands for these goods by European manufacturers, has led to the establishment of Splitdorf agencies in the principal cities. They are: Paris, 88 Avenue des Ternes; London, 139 Long Acre; Turin, Italy, 64 Via Santa Chiara; Brussels, Belgium, 33 Square Guttentberg; and Barcelona, Spain, 433 Consejo de Ciente.

**Royal Tourist Branches.**—The Royal Tourist Car Company has opened branches in New York and Chicago, the former at the corner of Broadway and 62d street, and the latter at 1253 Michigan avenue. Both of these have excellent locations, and equipped with factory facilities. These houses, as well as the agencies in other large cities, Boston, Philadelphia, Baltimore and elsewhere, have been meeting with great success in selling the new Royal Tourist cars.

#### RECENT BUSINESS CHANGES.

##### National Sales Corporation Will Move.

—An entire building at 232 West Fifty-eighth street, New York City, has been taken jointly by the National Sales Corporation and the Emil Grossman Company, and will be occupied on May 1. There are three floors, 20 by 100 feet in size, in the structure and, being right in the heart of the automobile district, will give the concerns an additional advantage in the trade. A complete stock of hydraulic and spring-action wind shields, Red Head spark plugs, Peugeot chains and rims and Pirelli tires will be carried.

##### Henry W. Price Company Changes Name.

—The firm name of the Henry W. Price Company, of Rockford, Ill., makers of the "Price" line of gloves, has been changed to the Fried-Ostermann Company, and a radical change made in the policies. E. C. Ostermann states that, "The watchwords of this concern will in the future be 'quality, progression, and aggression.' Both Mr. Fried and myself have been connected with the Price concern for years, and have long contemplated this change."

**Loring Auto Appliance Company Moves.**—Having outgrown both its present offices and factory at 1777 Broadway, New York City, the Loring Auto Appliance Company, Inc., has leased the entire building at 42 West 43d street, and will take possession on May 1. A number of new accessories have been taken on, and the concern will be prepared to branch out in these.

#### PERSONAL TRADE MENTION.

**Arthur N. Jervis**, one of the pioneer writers on automobile subjects, has been engaged by the Contest Board of the American Automobile Association to send out the official news and other information concerning the "Sixth Annual Reliability Touring Contest" of the A. A. A. This means that the work will be exceptionally well done, and the material which reaches editorial desks will be practically ready for the printer.

**Charles C. Craig** has been appointed manager of the Chicago branch of the Haynes Automobile Company, to take effect at once, succeeding J. B. Seibler. Mr. Craig is well known in the trade, having been identified with the industry for some years, principally in the capacity of traveling salesman for the Haynes and other companies.

**Montague Roberts**, the racing driver, has been appointed to the engineering boards of the Herreshoff Motor Company, of Detroit, and the Bristol Engineering Corporation, of Bristol, Conn. Since December he has been testing out the Herreshoff cars at Detroit, and he will do the same work with the new Houtp cars at Bristol.

**Otis R. Cook** has joined the forces of the Federal Rubber Company of Cudahy, near Milwaukee, Wis., as manager of the tire departments. James W. Devine accompanies Mr. Cook as his assistant. The company has established general offices in Milwaukee, with a branch at Milwaukee and Oneida streets.

**Joseph B. Deibler** has resigned as manager of the Chicago branch of the Haynes Automobile Company, which he has held for six years. He has not announced his intentions for the present, but in May will take a tour in a Haynes to a Dakota ranch for a vacation.

**James Joyce**, manager of the automobile department of the American Locomotive Company; C. B. Denney, treasurer of the company, and Leigh Best, vice-president of the company, are rusticating at Farmington, Conn., making their headquarters at the Country Club.

**Gilbert U. Burdette**, who has been in charge of Packard interests in Newark, N. J., has retired from the Packard agency, and joined the forces of the Atlantic Motor Car Company, in the management with C. J. McShane.

**E. W. McGookin**, sales manager of the Stewart & Clark Manufacturing Company of Chicago, has assumed the management of the Detroit branch, at 697 Woodward avenue.

**David Landau**, of the Palmer & Singer Manufacturing Company, has been appointed chief engineer, in the place of Oscar Stegeman who recently resigned.

**Geo. H. Brown**, secretary and treasurer of the Winton Company, and Mrs. Brown have returned to Cleveland from a visit to Atlantic coast points.

**Charles A. Singer, Jr.**, has been appointed general sales manager of the Palmer & Singer Mfg. Co.

#### RECENT INCORPORATIONS.

**Gilbert Manufacturing Company**, New Haven, Conn.—Capital \$12,000. To manufacture motorcycles and motorcycle parts. Incorporators: F. E. Bowers, E. B. Spalding, Louis F. Meyer.

**Sterling Gas Machine and Manufacturing Company**, Camden, N. J.—Capital \$25,000. To manufacture carburetors and gas machines. Incorporators: L. C. Simpson, J. W. Mills, G. A. Darlington.

**Barrell Pneumatic Tire Protector Company**, Boston.—Capital \$50,000. To manufacture and sell auto tires. President, H. A. Crossman; treasurer, R. H. Kammeler; clerk, A. E. Carson.

**Commercial Motor Car and Engine Company**, Chicago.—Capital \$20,000. General mercantile and manufacturing business. Incorporators: W. S. Mills, F. M. Olson, P. W. Kerr.

**W. & R. Motor Truck Company**, Taunton, Mass.—Capital \$50,000. General express business. President, F. S. Hall; treasurer and clerk, F. E. Wellman; attorney, Louis Swig.

**Victor Tire Traction Company**, Boston.—Capital \$50,000. To manufacture and sell tires. President, H. A. Crossman; treasurer, R. H. Kammeler; clerk, A. E. Carson.

**Auto Lock Company**, Chicago.—Capital \$50,000. To manufacture and deal in automobiles and accessories. Incorporators: R. W. Dunn, C. J. Monohan, L. A. Wisner.

**American Body Company**, Buffalo, N. Y.—Capital \$10,000. To manufacture motor and other vehicles. Incorporators: Edward W. Selkirk, E. J. Freltas, J. W. Kelly.

**C. N. Cady Company**, Canastota, N. Y.—Capital \$60,000. To manufacture motors, engines, machines, etc. Incorporators: C. N. Cady, G. B. Cady, Jr., Minnie A. Cady.

**Omnium Tire Import Company**, New York.—Capital \$10,000. To deal in automobile tires, sundries and supplies. Incorporators: Simon and Bourchard Haas, Edgar Block.

**North Jersey Garage**, Morristown, N. J.—Capital \$25,000. To manufacture automobiles. Incorporators: R. H. Nevins, R. S. Foster, Joseph Van Dyke, Harvey Archer.

**Hilton Manufacturing Company**, Boston.—Capital \$100,000. To manufacture and sell automobile supplies. President, R. W. Sawyer, Jr.; treasurer, J. S. Stone.

**Fulton Livery Company**, Fulton, N. Y.—Capital \$20,000. To run an auto livery and rent cars. Incorporators: M. A. Thomason, C. A. Reynolds, G. S. Piper.

**Sloane Motor Company**, Chicago.—Capital \$35,000. To manufacture motors and accessories. Incorporators: A. W. Baer, W. W. Sloane, D. M. Carter.

**Virginia Garage Corporation**, Roanoke, Va.—Capital from \$1,000 to \$25,000. To do a garage business.

**Cotta Transmission Company**, Rockford, Ill.—Capital \$40,000. To manufacture automobiles and accessories.

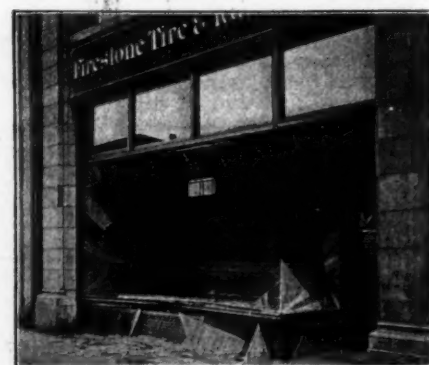
#### NEW AGENCIES ESTABLISHED.

**Middleby**, New York City.—Audobon Garage & Machine Works, 415 West 150th street, for New York City, except Brooklyn. D. L. Ormsby, proprietor.

**Selden**, Atlanta, Ga.—Selden Car Company, Columbia Garage, Edgewood avenue and Ivy street, G. G. Reid, sales manager.

**Rambler**, Lawrence, N. J.—Frank W. Thatcher.

**Maxwell**, Elmira, N. Y.—Jennison & Shea.



End of a Joy Ride.

A borrowed touring car dashed down Michigan avenue, Chicago, and into the window of the Firestone Rubber Co.'s branch as it in search of the non-skids which it lacked.

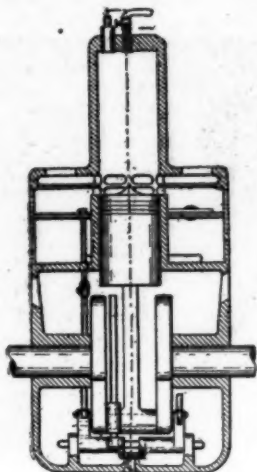


## SOME SELECTED AUTOMOBILE PATENTS

Issue of April 6, 1909.

916,972. Explosive Engine.—Linton T. Bassett, Salem, Mass. Filed Jan. 3, 1908.

The Bassett motor has an air cylinder concentrically placed around the lower extension of the cylinder walls. Within this is an auxiliary piston driven off of the crankshaft, which automatically uncovers an air port at the bottom of its stroke. The air entering there passes through the auxiliary piston and on the up stroke is compressed and forced into the cylinder proper.



Bassett Two-Cycle Motor.

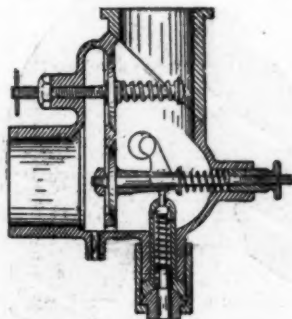
It is free to do this, as the main piston, at the bottom of its stroke, uncovers ports communicating with the concentric air chamber. Immediately above these, but separated from them and open to the atmosphere, are a series of exhaust ports. The engine is evidently intended to be run two-cycle with fuel injected at the proper point in the compression stroke so that the heat of compression will ignite the charge, as in the Diesel engine.

916,999. Air-Heater for Gasoline Engines.—Charles B. Chambers, Milo, Mo. Filed Jan. 25, 1908.

917,001. Wheel.—Carlton B. Chase, Worcester, N. Y. Filed March 19, 1908.

917,125. Carbureter.—Burt N. Pierce, Indianapolis, Ind. Filed Jan. 24, 1907.

This is an ingenious attempt to have the suction of the engine, which operates the air valve, control through this medium the inflow of gasoline as well. The end of the



Pierce Floatless Carbureter.

air valve stem is made tapering and the increase in this taper operates to increase or decrease the flow past the needle valve. A plunger is spring held against this stem and its lower end is formed to a point and acts as the needle valve.

917,165. Rotary Explosive Engine.—Carlo Sella, Biella, Italy. Filed Oct. 12, 1906.

917,205. Power Transmission Device.—Edward P. Warner, Chicago, assignor to Warner Clutch Company, Chicago. Filed March 30, 1908.

917,220. Friction Device.—Lawrence Whitcomb, Brookline, Mass., assignor to National Brake & Clutch Company, Boston. Filed July 10, 1907.

917,232. Cooling System for Internal Combustion Engines.—C. C. Worthington, Dunnfield, N. J. Filed Sept. 10, 1904.

917,264. Carbureter.—F. W. De Tray, Aurora, Ill. Filed Dec. 30, 1907.

917,283. Internal Combustion Engine.—Warren H. Frost, Los Angeles, Cal. Filed July 22, 1907.

917,353. Automobile Support.—Alfred J. Parker, Newark, N. J. Filed Aug. 3, 1908.

917,415. Automobile Alarm.—Edwin Copleston, Brooklyn, N. Y. Filed March 28, 1908.

917,422. Motor Vehicle.—Carson Durkee, Vicksburg, Mich. Filed Jan. 9, 1907.

917,463. Transmission Gearing.—E. E. Larson, Thompson, Ia. Filed June 26, 1908.

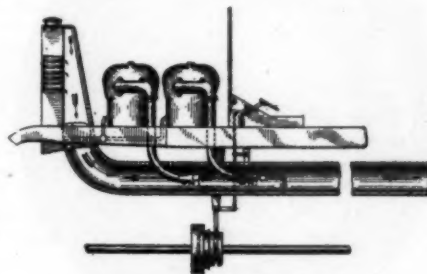
917,465. Motor Vehicle.—John N. Leach, Melrose, Mass. Filed Nov. 25, 1907.

917,493. Tire.—H. E. Schindler, Sisseton, S. D. Filed July 6, 1907.

917,560. Dry Battery Cell.—Walter S. Doe, Jersey City, N. J. Filed May 11, 1908.

917,572. Starting Apparatus for Automobiles and the Like.—Samuel J. Evans, Roanoke, Va. Filed Aug. 8, 1907.

917,598. Emergency Brake.—Jacob Hauser, Scottdale, Pa. Filed Oct. 10, 1908.



Worthington Cooling System.

917,612. Antiskidding Tire.—Eleazer Kempshall, London, Eng. Filed Apr. 20, 1908.

917,613. Non-skidding Tire.—Eleazer Kempshall, London, Eng. Filed April 20, 1908.

These are two American patents taken out by the English inventor whose product is already well known. The Kempshall tire as sold in this country is made with a series of deep depressions in the tread, these being circular with a slightly raised center. The tread portion of the tire is made extra heavy to allow of these depressions having quite a depth. The annular wall around the circular depressions forms a continuous surface at the edges of the tread portion. The circular holes constitute the non- or anti-skid part, the idea being that as the holes are pressed to the ground by the weight and speed of the car, the air is gradually squeezed out, forming a series of small vacuums. These do the work of resisting sideways motion.

917,722. Internal Combustion Engine.—James F. Duryea and William Remington, Springfield, Mass., assignors to Stevens-Duryea Company, Chicopee Falls, Mass. Filed Feb. 12, 1908.

This is apparently the first step toward a starting device, consisting as it does of a pressure reservoir connected to the cylinders so that they may be connected.

917,723. Tire for Vehicle Wheels.—Eleazer Kempshall, London, Eng., assignor to Kempshall Tire Company of Europe. Filed July 8, 1907.

917,734. Tire.—Eleazer Kempshall, London, Eng., assignor to Kempshall Tire Company of Europe. Filed July 25, 1907.

Issue of April 13, 1909.

917,764. Friction Clutch.—Harold Horsfall, Pittsburg, Pa. Filed June 5, 1908.

917,845. Spring Wheel.—J. J. Collins, Clemons, Pa. Filed Nov. 1, 1906.

917,883. Vehicle Wheel.—George W. Morris, Racine, Wis. Filed June 17, 1907.

917,926. Dust Pan or Shield for Automobiles.—Howard E. Coffin, Detroit, Mich. Filed July 18, 1907.

This is the underpan used on the Chalmers-Detroit cars and as the cut shows, is formed in a semi-circular shape with a lip at the top which hooks over the lower flange of the



Coffin Form of Dust Pan.

main frame. It is held there by means of a clip which is fastened to the outside of the frame section. A spring on the inside of this holds the pan tightly against the frame, which spring may be compressed by the fingers and the pan freed for removal.

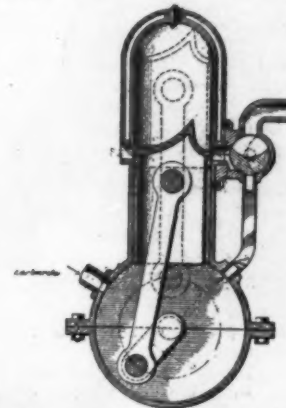
917,941. Valve Gear and Governing Mechanism for Explosion Engines.—Norman T. Harrington, Lansing, Mich. Filed Jan. 20, 1908.

918,122. Steering Device.—Charles E. Brooks, St. Louis, assignor to Roth Tool Company, St. Louis. Filed Oct. 5, 1908.

918,140. Gasoline Fire Engine.—William F. Gibbs, Philadelphia. Filed Feb. 5, 1908.

918,211. Internal Combustion Engine.—Charles W. Snyder, Hudson, N. Y. Filed April 20, 1907.

This is a two-cycle motor with crankcase compression, but the gas is led from there to the cylinder by means of a bypass in which is working a rotary valve. The latter is so



Snyder Rotary Valve Engine.

proportioned and driven from the crankshaft as to allow fresh air to be drawn into the cylinder on the end of the exhaust stroke and just before the inlet opens. This air helps to clean the exhaust gases out of the cylinder, insuring a full charge of pure gas.

918,429. Shock Absorbing Device.—Claude H. Foster, Cleveland, O. Filed Dec. 4, 1908.

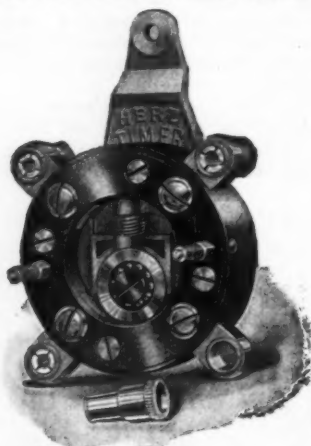
# Information for Auto Users

**Herz Improved Timers.**—Two new types of timers have been produced recently by Herz & Company, of New York, one being a wipe contact and the other having a roller-bearing contact. The feature of the former is in the contact itself, which has been radically changed so as to do away absolutely with any wear. The highest grade of Styrian tool steel, hardened sufficiently



NEW HERZ CONTACT.

to cut glass, is used in the contacts in the rim, the surface of which is subject to wear. The tool steel rim is embedded with an alloy metal which is part of the terminal, and is absolutely rigid. This particular contact has been tested thoroughly, and for six weeks it was run day and night, without showing any perceptible wear. The body of the timer is of rubber, and the revolving center, with



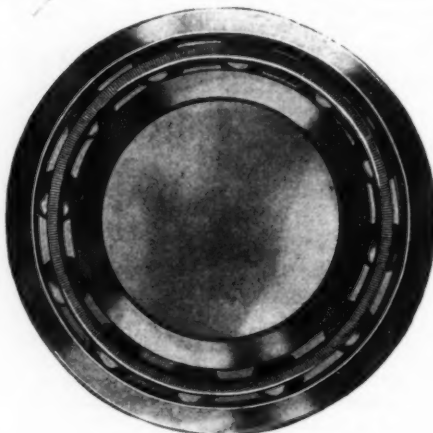
IMPROVED HERZ ROLLER TIMER.

its tool-steel plunger, runs on two sets of ball bearings.

In the roller-bearing timer, the roller is mounted in a square frame, a spring pushed parallelogram, and one of its several features is its compactness. The revolving section is supplied with two roller bearings, and indeed, the roller itself is an annular bearing which is held in a slide, set off the center. This slide is pressed forward by a spring, and though held rigid, will permit of ready self-adjustment. The contacts are made of hardened tool steel, set in vulcan fibre, and ground to caliber on a special

machine. The contacts are of the snap type. The workmanship on these specialties is of the same high grade as characterizes other Herz products.

**A Novelty in Radial Bearings.**—While ball bearings as a rule do not give as much trouble as many other parts of a car, when they do wear and get out of true they are a source of great trouble. It is asserted by many authorities that the fault of most bearings lies in the design and construction of the device used to separate the balls, and breakage or distortion of this part invariably puts the entire bearing out of commission. With a view of overcoming this sort of thing, the makers of the R. I. V. bearing, whose works are at Villar-Perosa, Italy, hit upon an invention of an anti-friction ring of babbitt metal, cast around the balls after they had been placed in proper position in the bearing. The properties of this metal as a "self-lubri-



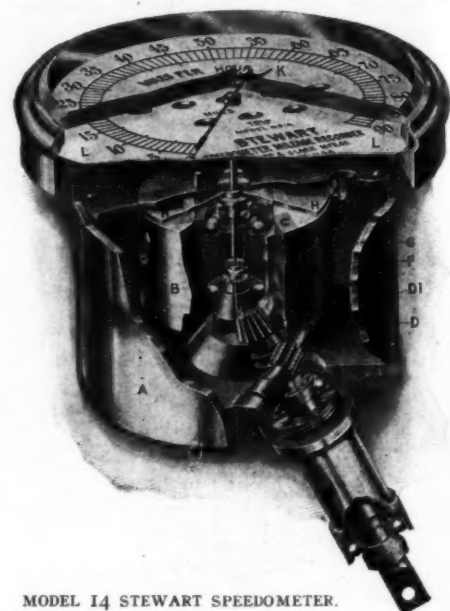
R. I. V. BALL BEARING.

cating" substance are well known, and by a special process the balls are loosened in this soft metal floating ring to such an extent that they revolve with perfect freedom, yet without the least noticeable play. It is through the fact that this ring is a floating arrangement, and is absolutely free from strain in any direction, and by its very nature frictionless, that it is claimed to be an indestructible device that never gets out of true, at least, up to 30,000 miles.

The balls are made of highest grade carbon crucible steel, perfectly hardened and finished with great accuracy, and the rings into which the balls fit are of the same quality of steel and accurately ground. Among the American manufacturers who have given the R. I. V. bearing an exhaustive tryout, and then placed an order for more, is the Packard Motor Car Company, of Detroit, Mich.

**Stewart Multipolar Speedometer, Model 14.**—This speedometer makes a special bid for public favor because of its extreme simplicity and costly construction. The mechanism, as shown by the illus-

tration, consists of but two moving parts, the rotor D and the disc H. The rotor, the actuating element, consists of a ring of non-ferrous material in which four permanent magnets are embedded. These magnets are accurately machined from imported Tungsten steel, made to special analysis—the costliest material obtainable for the purpose. The disc, the indicating means, is formed of an alloy



MODEL 14 STEWART SPEEDOMETER.

metal which is exceedingly light and has a low resistance. The rotor rides on hardened ball bearings, the disc on a diamond bearing. To the disc is attached a pointer which moves over an evenly graduated scale, very large in area. The standard or arm upon which Multipolar Model 14 is mounted with a clock is a distinct speedometer innovation, lifting the speedometer and clock away from the dash and making them both easily seen and read. The whole outfit is handsomely finished in brass and possesses unusual style and tone.

**Walker's Tire Bands for Preventing Blow-outs.**—A convenient form in which to have tire protectors is that of short individual covering strips that are independent of one another. This is the form in which the puncture and blow-out pre-



WALKER BLOW-OUT BAND.

venters made by the Walker Auto Tire Band Company, Indianapolis, come to the autoist. They may be had with or without metal tread mountings, the latter being mounted with 1-8 inch rivets swedged in tapering holes.



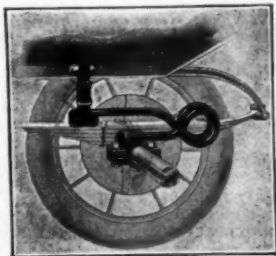
**Vanguard Spark Plug.**—What is claimed to be a spark plug that cannot be fouled or short-circuited by water, oil or carbon, has been patented by the Vanguard Manufacturing Company, of Joliet, Ill. It is shown in the accompanying illustration, and its makers call it "the plug of uninterrupted service." An extended demonstration of the plug to prove that it possessed the qualities claimed for it was made before crowds



VANGUARD SPARK PLUG.

of visiting dealers at the Chicago automobile show last January, and the good record which it made at that time is now having its effect in the large blocks of orders which are keeping its manufacturers busy. The Vanguard Company guarantees the plug not to quit sparking on account of any kind of fouling matter, and it is sold to dealers and individuals under this guarantee. It has terminal caps of a new and special design, adaptable for any old style or quick detachable terminals.

**A Simple Shock Absorber.**—One of the simplest devices of its character on the market at the present day is the Thomas shock absorber, manufactured by the Buffalo Specialty Company, Buffalo, N. Y. It consists of a combination of a double coiled spring and lever of peculiar construction, built of one piece of special steel and possessing great resiliency. The Thomas has no working



THOMAS SHOCK ABSORBER.

joints, frictions, pistons or plungers, and it is the claim of the makers that they eliminate the jolting and racking upthrow with absolute surety, and prevent the breakage of springs. The manufac-

turers are now making a special introductory offer embodying a free thirty-day trial, with return privileges if the user is not satisfied with the results.

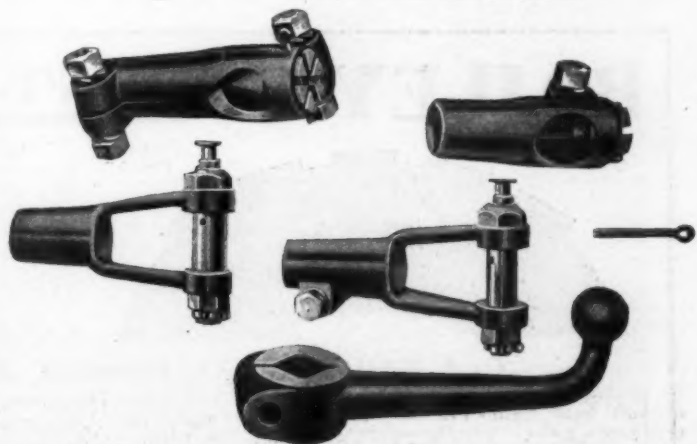
**Latest Thing in Tire Sleeves.**—As a first aid to the injured tire the Wiles tire sleeve, a good illustration of which is shown herewith, appears to meet all requirements, for a quick and lasting repair. Although it is of comparatively recent invention, the manufacturers, the Diamond Rubber Company, of Akron, O., is pushed to the limit to satisfy the demands made upon this department of its business. It is claimed for the Wiles tire sleeve that it meets every requirement and has points of superiority in that it is quickly and easily applied, covers every portion of the tire exposed



WILES SLEEVE IN PLACE.

(fitting closely to the rim) and is equally as good for rim cut or blow-out as for tread puncture. It requires no lacing, cannot creep after it is applied, and the quality of rubber and sea island fabric used in its construction gives it the highest degree of wear resistance. A fabric blow-out patch is furnished with each sleeve, so that the same may be applied should the injury to the tire require it. E. H. Harris, of the Diamond Rubber Company, in speaking of the Wiles tire sleeve, says: "Every one who has seen or used it is astonished at its effectiveness and simplicity. More than one auto enthusiast has said to me: 'Why didn't I think of that myself?'"

**B. & S. Steering Connections.**—The Billings & Spencer improved steering connections consist of five pieces, separate views of each being shown in the illustration which accompanies. The parts consist of a ball-arm, attached to the steering post; two socket connections, with safety lugs for securely binding the adjusting plugs, and right- and left-hand steering arm connections. The two last-named pieces are of new design and are so made as to facilitate adjustment to various sizes of steering arms. Special oil cups are also added. Each connection is a drop forging, made with the customary care for which this house is noted, from the best steel obtainable for the purpose, properly machined and carefully assembled. They are marketed by the manufacturers, the Billings & Spencer Company, Hartford, Conn.



THE BILLINGS & SPENCER COMPANY'S IMPROVED STEERING CONNECTIONS.

**Gobbo, God of Good Fortune.**—A new idea in mascots, made in bronze and threaded at the bottom so as to fasten



GOBBO, MASCOT.

readily to radiator filling cap. Gobbo's rule of life is "Be cheerful and you will be rich in everything." These mascots are made by the S. M. Supplies Company, Boston.

**How Flake Graphite Will Prevent Squeak in Springs.**—To prevent springs from squeaking, flake graphite gives instant relief. The springs may be taken off or the leaves separated by jacking the body up so as to take the weight off the springs, then some graphite may be floated between the leaves with kerosene or oil. This will give lasting lubrication and at the same time will not catch dirt or dust as plain oil or grease will. In this connection if Dixon's Motor Graphite, manufactured by the Joseph Dixon Crucible Company, Jersey City, N. J., is used on the inside of tire shoes it will prevent the shoes from sticking and is better than talc or chalk. Rims may be also advantageously treated with flake graphite as a preservative of rust. The application of a thin coating of quick drying shellac varnish, to which some flake graphite has been added has been found to give good results, also if all threaded connections are made with graphite and oil, or, better yet, a specially prepared graphite joint compound, the joints may be taken apart at any time without trouble.

**Save Your Radiator.**—If you wish to preserve the water jackets of your engine or prolong the life of the radiator, an excellent preservative is that known as Nonkoroda. This is a compound which removes and prevents the formation of rust or scale, thus eliminating expensive repairs caused by leaky radiators. It is made by the Nonkoroda Company, New York City.

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